APPENDIX D:
ALTERNATIVES SCREENING REPORT

ALTERNATIVES SCREENING REPORT

SYCAMORE-PEÑASQUITOS 230-KV TRANSMISSION LINE PROJECT ALTERNATIVES SCREENING REPORT

ATTACHMENT A

ATTACHMENT B

APPENDIX D
ALTERNATIVES SCREENING REPORT

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Sycamore–Peñasquitos 230-kV Transmission Line Project

Alternatives Screening Report

AUGUST 2015

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Sycamore–Peñasquitos 230-kV Transmission Line Project

Alternatives Screening Report

AUGUST 2015

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1 INTRODUCTION

1.1 PURPOSE

San Diego Gas & Electric (SDG&E) submitted an application (A.14-04-011) for a Certificate of Public Convenience and Necessity (CPCN) for the Sycamore–Peñasquitos 230-Kilovolt (kV) Transmission Line Project (Proposed Project) on April 7, 2014. The application was deemed complete on July 24, 2014. The Proposed Project is described in detail in Chapter 2 of the Environmental Impact Report (EIR). This document describes the alternatives screening analysis that has been conducted for the Proposed Project, supplementing the alternatives analysis information presented in Chapter 3 of the EIR.

Alternatives to the Proposed Project include:

- Alternatives identified by SDG&E in the application for a CPCN
- Alternatives identified in other proceedings, studies, and documents such as the Sunrise Powerlink Project EIR/EIS
- Alternatives identified during the public scoping process that was held in accordance with California Environmental Quality Act (CEQA) requirements
- Alternatives identified by the CPUC EIR team as a result of the independent review of the Proposed Project impacts and meetings with affected agencies and interested parties

The alternatives screening analysis was completed in order to identify potentially feasible alternatives that would be carried forward in the EIR.

This report documents: (1) the alternatives that have been suggested and evaluated; (2) the approach and methods used by the CPUC in screening the potential feasibility of these alternatives according to guidelines established under CEQA; and (3) the results of the alternatives screening process (i.e., which alternatives are analyzed in the EIR).

The Alternatives Screening Report is incorporated as Appendix D to the EIR, providing the basis and rationale for whether an alternative has been carried forward to full evaluation in the EIR. For each alternative that was eliminated from further consideration, this document explains in detail the rationale for elimination. Since full consideration of the No Project Alternative is required by CEQA, this report does not address this alternative (it is defined in Chapter 3: Alternatives, of the EIR).

1.2 ALTERNATIVES CONSIDERATION IN EIR SCOPING

The process for identifying alternatives to the Proposed Project involved several steps including opportunities for public comment. The process is described in this section.

On August 11, 2014, a Notice of Preparation (NOP) announcing a 30-day scoping period (August 18, 2014 to September 16, 2014) was sent to interested agencies and members of the public to inform recipients that the CPUC was beginning preparation of the Sycamore-Peñasquitos 230-kV Transmission Line Project EIR and to solicit information that would be helpful in the environmental review process. Following the release of the NOP, three public scoping meetings were held (one on August 25th and two on August 26th, 2014), and a Scoping Report was prepared to document comments received.

After the Fall 2014 scoping period, the EIR team assessed 41 alternatives, including nine identified by SDG&E in its Proponent's Environmental Assessment (PEA). The rest of the alternatives were suggested by the public and agencies, defined as alternatives to the previous Sunrise Coastal Link (a proposed but un-adopted link of the Sunrise Powerlink Project), or were developed by the EIR team in order to reduce or avoid impacts of the Sycamore-Peñasquitos 230-kV Transmission Line Project as proposed. In this alternatives screening report, five alternatives are recommended for detailed EIR analysis and the remaining approximately 36 alternatives are recommended for elimination from detailed analysis.

1.3 SUMMARY OF PROPOSED PROJECT

1.3.1 Project Overview and Background

The Proposed Project is described in detail in Chapter 2: Project Description of this EIR. A new 230-kV transmission line would be installed between the existing SDG&E Sycamore Canyon Substation located on Marine Corps Air Station (MCAS) Miramar and the existing Peñasquitos Substation in the Torrey Hills area of the City of San Diego. The Proposed Project would be located within the cities of San Diego, Poway, and Carlsbad, and partially within MCAS Miramar. The entire Proposed Project would be located in San Diego County, in existing SDG&E right-of-ways (ROWs) or within existing public roadways.

The transmission line would span a total of approximately 16.7 miles and include both overhead and underground segments. The Proposed Project would consolidate two existing 69-kV power lines onto a total of 64 new steel poles, and replace 72 existing predominately wood structures. Twenty stringing sites would be used for conductor construction activities. All of the steel poles, regardless of foundation type, would require the installation of a minimum of two grounding rods buried approximately 6 to 18 inches deep.

A portion of Segment A and all of Segment D follows the same alignment as the Coastal Link segment of the 150-mile-long Sunrise Powerlink Project. SDG&E originally filed an application in December 2005 (A.05-12-014) and then refiled an application in August 2006 (A.06-08-010) with the CPUC for a CPCN to construct the Sunrise Powerlink Project. The Coastal Link, as

proposed in the Sunrise Powerlink Project, consisted of a 13.6-mile-long 230-kV line with new towers between Sycamore Canyon and Peñasquitos Substations. The CPUC approved the Sunrise Powerlink Project in December 2008 in Decision 08-12-058, but the Commission did not approve the Coastal Link portion and instead adopted the modified Coastal Link System Upgrades Alternative. The modified Coastal Link System Upgrades Alternative made the proposed Coastal Link transmission line segment unnecessary and instead identified transformer and reconductoring projects that would reduce costs and minimize impacts. The CPUC approved the Coastal Link System Upgrades Alternative because it met the objectives of the Coastal Link segment of the Sunrise Power Link Project, while reducing costs and environmental impacts.

The proposed route is described below in four segments (A through D) starting at the southeastern end of the project, followed by a description of the substation modifications, modifications at Encina Hub, proposed changes in the existing Mission – San Luis Rey phasing, access roads, and temporary staging areas associated with the Proposed Project.

1.3.2 Segment A: Sycamore Canyon Substation to Carmel Valley Road

Segment A would consist of approximately 8.3 miles of overhead 230-kV transmission line from Sycamore Canyon Substation to Carmel Valley Road. The new transmission line would be installed on a total of 42 new poles including:

- 37 new double-circuit 230-kV tubular steel poles (TSPs)
- Two 138-kV TSPs (expected heights of 120 feet and 75 feet, respectively)
- One 230-kV single-circuit TSP
- One 230-kV TSP/138-kV cable pole
- One 138-kV steel H-frame structure

Two existing 138-kV transmission lines (TL) (TL 13820 and TL 13825, both of which terminate at Chicarita Substation) would be relocated to the new steel poles. Approximately 47 existing structures associated with the two relocated 138-kV transmission lines would be removed. The existing structures that would be removed include the following:

- 40 138-kV single-circuit wood H-frame structures
- Two 138-kV single circuit TSPs
- Two 138-kV steel H-Frame structures
- Two 138-kV single-circuit wood poles
- One 138-kV double-circuit cable pole

An approximately 850-foot portion of one transmission line would be located underground as it exits the Sycamore Canyon Substation. One existing transmission line would be relocated to approximately two new 230-kV structures within and immediately adjacent to the Sycamore Canyon Substation to make room for a new 230-kV connection at the substation.

1.3.3 Segment B: Underground Carmel Valley Road

Segment B includes construction of 2.84 miles of new 230-kV transmission line underground in Carmel Valley Road in the Rancho Peñasquitos area of San Diego. The segment begins from approximately the intersection of Carmel Valley Road with Black Mountain Park Way and extends southwest about 250 feet east of the intersection of Carmel Valley Road with Via Abertura in the Torrey Highlands area.

Two 160-foot-tall 230-kV steel cable poles for underground/overhead transmission conversion would be placed at the ends of the undergrounded segment. One double-circuit steel lattice tower would be removed.

The new cable pole on the east end of Segment B would be located north of Carmel Valley Road, within an existing community sports park. The underground transmission line would connect from the median in Carmel Valley Road to a new pole utilizing the access driveway to the park, with an access vault installed near the park entrance. The vault would be used initially to pull the cables through the conduits and later to splice cables together. During operation, the vaults would provide access to the underground cables for maintenance inspections, repairs, and replacement, if needed. Each vault typically has two manhole covers measuring approximately 36 inches in diameter.

1.3.4 Segment C: Carmel Valley Road to Peñasquitos Junction

Beginning 250 feet east of the intersection of Carmel Valley Road with Via Abertura in the Torrey Highlands area of San Diego, Segment C extends south for 2.19 miles and ends at Peñasquitos Junction, which refers to a confluence of existing power lines in the Del Mar Mesa area. Segment C passes through portions of the Del Mar Mesa Preserve.

Two existing 230-kV transmission lines would be consolidated on 10 existing double-circuit steel lattice towers, creating a vacant position for the new 230-kV transmission line. At the Peñasquitos Junction, a new steel pole would replace one existing steel lattice tower.

1.3.5 Segment D: Peñasquitos Junction to Peñasquitos Substation

Segment D involves approximately 3.34 miles of 230-kV conductor on existing double-circuit steel lattice towers between the Peñasquitos Junction and the Peñasquitos Substation. Two existing 69-kV power lines (TL 675 and TL 6906) would be relocated onto 17 new 69-kV double-circuit TSPs and 22 existing 69-kV wood structures would be removed. One new single-circuit tubular steel pole would replace two existing 69-kV single-circuit wood cable poles outside the Peñasquitos Substation. The relocation of TL 6906 would create a vacant position on the existing 230-kV steel lattice towers. An existing power line, TL 13804, would be relocated from the south side of the existing 230-kV towers to the north side to create a more efficient installation and operation of the new 230-kV transmission line.

1.3.6 Substation Modifications

Minor alterations to the Sycamore Canyon, Peñasquitos, Chicarita, San Luis Rey, and Mission Substations would be needed to accommodate the addition of the new 230-kV transmission line. Modifications for these substations include adjusting the configuration of the transmission and power lines, adjusting relaying, and upgrading line protection.

At the Sycamore Canyon and Peñasquitos Substations, minor modifications to bay stations (the part of a substation within which the switchgear and control-gear relating to a given circuit is contained), installation of voltage transformers, and use of existing pole structures to accommodate the new and relocated transmission lines would be necessary. At the Sycamore Canyon Substation, the new 230-kV transmission line would be installed on TSPs to connect to the substation. Two new 230-kV TSPs would need to be installed within and immediately adjacent to the substation to accommodate the transfer of existing 230-kV transmission lines. An existing 138-kV power line would be installed underground (850 feet in length). At the Peñasquitos Substation, new steel cable poles would be installed to connect the existing 69-kV power lines (TL 675 and TL 6906) to the substation using existing duct banks.

1.3.7 Encina Hub Modifications

An existing San Luis Rey – Mission 230-kV power line would be removed from service at the Encina Hub to create an open position for the proposed 230-kV transmission line in Segment C.

1.3.8 Mission – San Luis Rey Phase Transposition

The positions of the existing 230-kV line phase components between the Mission Substation and the Peñasquitos Junction (intersection of Segments C and D) would be reversed in order to accommodate the proposed bundling of power lines within Segment C to accommodate placement of the new 230-kV line.

1.3.9 Access Roads

Construction would primarily take place within the existing SDG&E ROW easements, access roads, and public roadways. Most work areas would be accessible by vehicle on unpaved SDG&E-maintained access roads or by overland travel. Access roads would be used for vehicle parking and turnaround, and construction site staging.

Access roads would generally be 12 to 14 feet wide for straight sections and up to 20 feet wide at sharp curves when necessary to ensure safe movement of construction equipment and vehicles. Existing access roads may be re-established or otherwise maintained through smoothing or vegetation removal to ensure that construction access is available.

1.3.9.1 New Spur Roads

Three new spur roads are proposed along Segment A:

- A new, approximately 290-foot-long spur road would be required to access proposed structure P2 adjacent to the Sycamore Canyon Substation. Vegetation

would be removed and the land would be graded to create a road about 12 to 14 feet wide in the straight segment and up to 20 feet wide in the curved section.
- A new, approximately 200-foot-long spur road would be required to access a proposed structure, P17. Vegetation would be removed and the land would be graded to create a straight road about 12 to 14 feet wide.
- A new, approximately 150-foot-long spur road would be required to access a proposed structure, P18. Vegetation would be removed and the land would be graded to create a straight road about 12 to 14 feet wide.

1.3.9.2 Temporary Access Roads

A temporary access road would be required to access proposed structures P20 and P21 in Segment A, requiring roughly 6,000 square feet of vegetation clearing and minor grading (approximately 10 cubic yards). Once construction is complete, the access road would be re-contoured to the existing slope.

Three temporary access road segments may be required to access proposed structures P45 and P46 in Segment D in order to avoid road rut vernal pools located within existing access roads. Roughly 660 linear feet and 9,900 square feet of vegetation clearing and minor grading (approximately 60 cubic yards) would be required. Once construction is complete the temporary access road segments would be re-contoured to the existing slope. Temporarily impacted areas would then be restored consistent with the NCCP protocols and Enhancement Program. The existing access road would be used for limited operation and maintenance access after construction, consistent with current activities in this area.

1.3.9.3 Overland Travel and Passing Locations

No overland travel routes are proposed to access work areas. Up to 30 passing locations outside of existing work areas and access roads may be required for vehicles to pass each other during construction. Passing areas would be located directly adjacent to existing access roads and would occur in primarily disturbed, ornamental, or non-native grassland areas. Passing lanes would typically be 15 feet wide and 30 feet long (450 square feet per location) and would involve minimal grading or other improvements.

1.3.10 Temporary Staging Yards

The Proposed Project would utilize seven temporary construction staging yards totaling approximately 51 acres. Staging yards would be used for vehicles equipment refueling, pole assemblage, open storage of material and equipment, construction trailers, portable restrooms, parking, lighting, potential generator use for temporary power in construction trailers, and incidental landing areas for helicopters. Mission, Peñasquitos, San Luis Rey, and Sycamore Canyon Substations may be used for temporary storage of materials, as needed. The staging yards include:

- Camino Del Sur
- Carmel Valley Road
- Evergreen Nursery
- State Route 56

- Stonebridge
- Stowe

Construction workers typically meet at the staging yard each morning and park their vehicles at the yard. In-ground fencing would be installed at the staging yards wherever it is not already installed. Gravel may be used to line the ground at staging yards to avoid the creation of unsafe mud conditions and unnecessary sediment transport off site.

Incidental landing areas (ILAs) are used for short-term helicopter operations, such as picking up conductor or other equipment. Helicopters would be staged out of local airports (such as McClellan Palomar, Montgomery, and Gillespie) and would utilize construction staging areas as ILAs, with the exception of the Evergreen Nursery staging yard. Helicopter staging activities, such as refueling and maintenance, would be conducted at the local airport(s).

1.3 ALTERNATIVES OVERVIEW

In total, the alternatives screening process has culminated in the identification and screening of 41 potential alternatives or combinations of alternatives. Alternative types include transmission pole relocation alternatives, overhead and underground transmission route alternatives to SDG&E's proposed transmission line route, and electrical system alternatives such as upgrades to other parts of the electrical system, distributed generation, and energy conservation. Five alternatives were retained for analysis in the EIR and 36 alternatives were eliminated from further analysis. The rationale for screening each of these alternatives is presented in detail in Section 4 of this screening report.

Table 1.3-1 lists each project alternative included in this Alternatives Screening Report, including the source for each alternative and the alternative type.

Table 1.3-1 Alternatives Considered in Screening Analysis

Alternative	Source	Type
Segment B Eastern Cable Pole Option 1a	SDG&E Application	Pole Relocation
Segment B Eastern Cable Pole Option 1b	CPUC	Pole Relocation
Segment B Eastern Cable Pole Option 2	SDG&E Application	Pole Relocation
Segment B Eastern Cable Pole Option 3	CPUC	Pole Relocation
Segment B Eastern Cable Pole Option 4	CPUC	Pole Relocation
Segment B Western Cable Pole	SDG&E Application	Pole Relocation
Segment D Pole Relocations South of the Existing Poles	Public Scoping	Pole Relocation
Segment A Pole Relocations	CPUC	Pole Relocation
Northern Alignment No. 1	SDG&E Application	Transmission Route
Northern Alignment No. 2	SDG&E Application	Transmission Route
Northern Alignment No. 3	SDG&E Application	Transmission Route
Northern Alignment No. 4	SDG&E Application	Transmission Route
Southern Alignment No. 5	SDG&E Application	Transmission Route
Southern Alignment No. 6	SDG&E Application	Transmission Route
Underground Alignment No. 7	SDG&E Application	Transmission Route
Stonebridge-Mira Mesa Alignment	CPUC	Transmission Route
Los Rosas-Park Village Alignment	CPUC	Transmission Route
Segment D 69-kV Partial Underground Alignment	CPUC	Transmission Route
Sunrise Coastal Link Alignment	Sunrise Powerlink EIR/EIS	Transmission Route
Pomerado Road to Miramar Area North – Combination Underground/Overhead Alternative	Sunrise Powerlink EIR/EIS	Transmission Route
Pomerado Road to Miramar - Underground/Overhead Alternative	Sunrise Powerlink EIR/EIS	Transmission Route
Los Peñasquitos Canyon Preserve-Mercy Road Underground Alternative	Sunrise Powerlink EIR/EIS	Transmission Route
Mannix-Dormouse Road Alternative	Sunrise Powerlink EIR/EIS	Transmission Route
SDG&E Segment 13 Scripps Ranch Alternative	Sunrise Powerlink EIR/EIS	Transmission Route
SDG&E Segment 16 North of Peñasquitos Alternative	Sunrise Powerlink EIR/EIS	Transmission Route
MCAS Miramar – All Underground and Underground/Overhead Alternative	Sunrise Powerlink EIR/EIS	Transmission Route
MCAS Miramar – Combination Underground/Overhead Alternative	Sunrise Powerlink EIR/EIS	Transmission Route
Rancho Peñasquitos Boulevard Bike Path Alternative	Sunrise Powerlink EIR/EIS	Transmission Route
State Route 56 Alternative	Sunrise Powerlink EIR/EIS	Transmission Route

Alternative	Source	Type
MP 146.5 to Peñasquitos Substation Underground/Consolidation Alternative	Sunrise Powerlink EIR/EIS	Transmission Route
Scripps Poway Parkway to State Route 56 Alternative	Sunrise Powerlink EIR/EIS	Transmission Route
Scripps Poway Parkway-Pomerado Road Underground Alternative	Sunrise Powerlink EIR/EIS	Transmission Route
CAISO Approved Mission – Peñasquitos 230 kV Transmission Line	2014-2015 Transmission Plan; ORA	Electrical System
CAISO Approved Mission – Peñasquitos 230-kV Transmission Line and New Sycamore – Mission 230-kV Transmission Line	CPUC	Electrical System
Loop-in of a Single Mission – San Luis Rey Transmission Line into Peñasquitos	CPUC	Electrical System
Loop-in of Both Mission – San Luis Rey 230-kV Lines Into Peñasquitos Substation	CPUC	Electrical System
New Sycamore – Mission 230-kV Transmission Line and Loop-in of One Mission – San Luis Rey Line Into Peñasquitos Substation	CPUC	Electrical System
New Mission – Peñasquitos 230-kV Line and Reconfigured and Reconductored Power Lines	ORA	Electrical System
New Mission – Peñasquitos 230-kV, Reconductored Poway-Pomerado, and Series Reactor	ORA	Electrical System
Imperial Irrigation District Hoober to Songs Line	CPUC Consultant	Electrical System
Increased Generation at Carlsbad and/or Encina during Peak Loads	CPUC	Non-Wire
Distributed Generation (Renewables)	CPUC; Public Scoping; Public Utilities Code Section 1002.3	Non-Wire
Energy Efficiency and Conservation	CPUC; Public Scoping; Public Utilities Code Section 1002.3	Non-Wire
Demand Response	CPUC; Public Utilities Code Section 1002.3	Non-Wire

2 BACKGROUND AND PREVIOUS DOCUMENTS

The studies and proceedings that identify possible alternatives for the Sycamore–Peñasquitos 230-kV Transmission Line Project are outlined below. This screening process reconsiders alternatives that were previously evaluated as alternatives to the Sunrise Coastal Link Alternative to determine their current viability. Section 4 describes each individual alternative, and identifies the source from which each alternative originated.

2.1 SUNRISE POWERLINK PROJECT

The Sunrise Powerlink is an approved and on-line 500/230-kV transmission line project connecting the Imperial Valley Substation to the Peñasquitos Substation, improving electric reliability within the San Diego area, reducing energy costs, and bringing renewable energy to San Diego County from Imperial County (CPUC and BLM 2008). The EIR/Environmental Impact Statement (EIS) and Draft Land Use Plan Amendment for the Sunrise Powerlink Project was approved by the U.S. Forest Service (USFS) in July 2010, the Bureau of Land Management (BLM) in January 2009, and the CPUC in December 2008. All of the routes considered within the Sunrise Powerlink Project Routing Study were included in the Sunrise Powerlink Project EIR/EIS Alternatives Screening Report. The Sunrise Powerlink Project Routing Study was used to define alternative transmission line routes for the Sunrise Powerlink Project.

The Coastal Link was one proposed segment of the Sunrise Powerlink Project. The Coastal Link consisted of approximately 13.6 miles of 230-kV line with new towers proposed between Sycamore Canyon and Peñasquitos Substations. A portion of Segment A and all of Segment D of the Sycamore-Peñasquitos 230-kV transmission line follows the same alignment as the Coastal Link. The Coastal Link portion of the Proposed Project was not approved and was never constructed. The modified Coastal Link System Upgrades Alternative was adopted instead, and transformer and reconductoring projects that would reduce costs and minimize impacts were identified. However, the Coastal Link alternatives developed as part of the Sunrise Powerlink Project alternatives screening process are considered in this Alternatives Screening Report as possible alternatives for the Proposed Project.

2.2 2012-2013 TRANSMISSION PLAN

The California Independent System Operator (CAISO) conducts a Transmission Planning Process each year, which builds upon the previous year's plan and studies the reliability of the electric system over a 10-year window. As part of the 2012-2013 Transmission Planning Process, CAISO issued a Functional Specification that stated the need for a transmission line between

Sycamore Canyon and Peñasquitos Substations with at least 1,175 megavolt-amperes (MVA) of capacity (CAISO 2014a). The 2012-2013 Transmission Plan, approved by the Board of Governors in March 2013, identified the Sycamore-Peñasquitos 230-kV Transmission Line Project as eligible for competitive solicitation and assumed the line would be in service by 2017 (CAISO 2013).

In the summer of 2013, a Governor's task force was formed with representatives from CAISO, CPUC, and California Energy Commission (CEC) to create a Preliminary Reliability Plan for the Los Angeles Basin and San Diego. This task force identified the Sycamore-Peñasquitos 230-kV Transmission Line Project as necessary in Section 2, Near Term Needs 2014-2017 (CEC 2013). Subsequent to the release of the Governor's task force report, CAISO became responsible for selecting the project sponsor to build the line.

SDG&E submitted their confidential Transmission Project Sponsor Proposal Application to CAISO in June 2013, and a revised version in July 2013. As part of the development of the Proposed Project, SDG&E reviewed potential routes, transmission line configurations, and transmission line types. Shorter, more direct alternatives were determined to have potentially lower construction costs, but higher schedule, cost risk, and uncertainty, as well as potential for significant environmental impacts. Similarly, an alternative that would have involved construction of an all-underground transmission line had a higher level of schedule and risk uncertainty compared to the Proposed Project, as well as much higher anticipated cost. CAISO reviewed four separate proposals to construct and operate a new 230-kV transmission line between the existing Sycamore Canyon and Peñasquitos Substations and selected SDG&E as the approved project sponsor, rejecting the other three proposals (CAISO 2014b).

2.3 2014-2015 TRANSMISSION PLAN

The CAISO Board of Governors approved the 2014-2015 Transmission Plan in March 2015. This more recent transmission plan identifies additional approved additions and upgrades to the transmission infrastructure based on CAISO's continued monitoring of the demand-side programs progress, the utilities' progress in procuring authorized resources, and the progress of approved transmission mitigations. Transmission infrastructure upgrades for the San Diego region in this transmission plan are also considered in the alternatives screening process for the Proposed Project. The Mission–Peñasquitos 230-kV Transmission Line was approved by CAISO in the 2014-2015 Transmission Plan and it is evaluated as an electrical system alternative in this Alternatives Screening Report.

3 OVERVIEW OF ALTERNATIVES EVALUATION

The range of alternatives in the screening report was identified through the CEQA scoping process and through supplemental studies and consultations that were conducted during the course of this analysis. The range of alternatives considered in the screening analysis encompasses:

- Alternatives identified by SDG&E
- Alternatives identified in other proceedings, studies, and documents such as the Sunrise Powerlink Project EIR/EIS
- Alternatives identified during the public scoping process that was held in accordance with CEQA requirements
- Alternatives identified by the CPUC EIR team as a result of the independent review of the Proposed Project impacts and meetings with affected agencies and interested parties

3.1 ALTERNATIVES SCREENING METHODOLOGY

The alternatives were evaluated using a screening process that consisted of three steps:

Step 1: Clearly define each alternative to allow comparative evaluation.

Step 2: Evaluate each alternative in comparison with the Proposed Project using CEQA criteria (defined below).

Step 3: Based on the results of Step 2, determine the suitability of each alternative for full analysis in the EIR by looking at whether the alternative: (1) is reasonable, (2) achieves all or most of the project's objectives, (3) is potentially feasible, and (4) avoids or substantially lessens an environmental impact of the project as proposed. If the alternative is unsuitable, eliminate it from further consideration.

3.2 CEQA REQUIREMENTS FOR ALTERNATIVES

CEQA provides guidance on selecting a reasonable range of alternatives for evaluation in an EIR. This alternatives screening and evaluation process satisfies CEQA requirements. The CEQA requirements for selection of alternatives are described below.

An important aspect of EIR preparation is the identification and assessment of reasonable alternatives that have the potential for avoiding or minimizing the impacts of a proposed project. The CEQA Guidelines require consideration of the No Project Alternative (Section

15126.6(e)) and selection of a range of reasonable alternatives (Section 15126.6(d)). The EIR must adequately assess these alternatives to allow for a comparative analysis for consideration by decision makers. The CEQA Guidelines (Section 15126.6(a)) state that:

> *An EIR shall describe a reasonable range of alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation.*

To comply with CEQA requirements, each alternative that has been suggested or developed for this Project has been evaluated in three ways:

1. Does the alternative accomplish all or most of the basic project objectives?
2. Is the alternative potentially feasible (from economic, environmental, legal, social, and technological standpoints)?
3. Does the alternative avoid or substantially lessen any significant effects of the Proposed Project (including consideration of whether the alternative itself could create significant environmental effects potentially greater than those of the Proposed Project)?

Each of these criteria is described in more detail in the following sections.

3.2.1 Consistency with Project Objectives

3.2.1.1 SDG&E Project Objectives

SDG&E identified the following objectives for the Proposed Project in their Application for a CPCN (SDG&E 2014):

1. Meet the CAISO 2012–2013 Transmission Plan Functional Specifications for a new 230-kV transmission line between the Sycamore Canyon and Peñasquitos Substations by:
   a. Ensuring the SDG&E bulk electric system continues to meet North American Electric Reliability Corporation, Western Electricity Coordinating Council, and CAISO reliability criteria
   b. Promoting compliance with State of California policy goals related to renewable integration and Once-Through Cooling retirement
   c. Economically and reliably meeting the San Diego metropolitan area's forecasted load growth
   d. Delivering energy more efficiently to the load center in San Diego
2. Locate the Proposed Project's facilities in existing transmission and power line corridors, SDG&E ROW, SDG&E-owned property, and San Diego franchise ROW.

3.2.1.2 Basic Project Objectives

Project objectives under CEQA are defined in order to allow proper consideration of alternatives to the Proposed Project. Having taken into consideration the objectives set forth by SDG&E above, the CPUC identified three basic project objectives. These objectives are used by the CPUC to define and evaluate a range of reasonable alternatives to the Proposed Project. The evaluation of alternatives in this EIR provides information on whether each alternative could feasibly accomplish most or all of these project objectives. The three CPUC project objectives are presented and explained below.

CPUC Project Objective 1: Maintain long-term grid reliability in the absence of San Onofre Nuclear Generating System (SONGS) generation

CPUC Project Objective 1 reflects the goal of mitigating the loss of nuclear power generation at SONGS. SONGS was taken offline in 2012 and permanent retirement of the nuclear power plant began in June 2013 (CEC 2015). The retirement of SONGS resulted in the loss of 2,150 MW of generation in the Los Angeles and San Diego region (*ibid*). The San Diego region in particular lost access to over 700 MW of generation to support its load (i.e., energy demand). The reduction of generation resources supporting SDG&E load via Path 44 (the five 230-kV lines from SONGS feeding into the San Luis Rey and Talega Substations) needs to be replaced.

CAISO evaluated alternatives to mitigate the loss of electric generation at SONGS in its 2012-2013 Transmission Plan (CAISO 2013). Dynamic reactive support in the SONGS Talega area, Huntington Beach synchronous condensers and additional generation of electricity in San Diego County are part of the overall strategy for mitigating the loss of electric generation at SONGS, but are not a part of CPUC Project Objective 1. This CPUC project objective is focused on adding transmission capacity to increase delivery of existing energy resources to meet NERC, WECC and CAISO planning criteria for system reliability.

CPUC Project Objective 2: Deliver energy more efficiently to the load center in San Diego

CPUC Project Objective 2 reflects the goal of alleviating congestion on the power lines out of Sycamore Canyon Substation. Electricity is currently delivered into Sycamore Canyon Substation from the Suncrest 500/230-kV substation and energy is delivered out of Sycamore Canyon Substation by lower capacity 138-kV and 69-kV power lines. The lower capacity 138-kV and 69-kV power lines out of Sycamore Canyon Substation become congested under normal operating conditions (CAISO 2013). This congestion results in thermal overloads on power and transmission lines in SDG&E's system during peak summer demand.

CPUC Project Objective 3: Support deliverability of renewable resources identified in SDG&E's Renewable Portfolio Standard (RPS) portfolio

CPUC Project Objective 3 reflects the goals of delivering renewable resources in SDG&E's RPS portfolio. Table 3.2-1 summarizes the renewable energy in SDG&E's RPS portfolio. This objective is related to CPUC Project Objective 2 because delivery of renewable energy entering Sycamore Canyon Substation via Sunrise Powerlink is constrained by the 138-kV and 69-kV electrical system. Additional capacity is needed to deliver renewable energy in San Diego's RPS portfolio that enters San Diego via Sunrise Powerlink.

Table 3.2-1 Summary of Renewable Generation in San Diego RPS Portfolio

Area	Cost Constrained	Renewable Generation by Portfolio (MW)		
		Commercial Interest	Environmental	High DG
Imperial – SDGE	220	921	921	220
Imperial – IID	920	1,219	1,219	920
San Diego South	384	384	384	0
Baja	0	100	0	0
Arizona	550	550	550	550
Non-CREZ – SDGE	17	17	17	17
SDGE DGs	405	405	426	490

Source: CAISO 2013

In addition to CEQA Guidelines and the basic project objectives as listed above, CPUC uses the following guiding principles when considering the appropriate criteria for selecting alternatives for evaluation in the EIR:

> *Public Utilities Code Section 1002.3 requires CPUC to "...consider cost-effective alternatives to transmission facilities that meet the need for an efficient, reliable, and affordable supply of electricity. . .", and the CPUC's Information and Criteria List for project applications requires discussion of ". . .alternatives capable of substantially reducing or eliminating any significant environmental effects, even if these alternatives substantially impede the attainment of the project objectives, and are more costly."*

The determination of whether to eliminate or retain alternatives in the EIR was based on the alternative's ability to meet the basic project objectives as defined by CPUC and follow the above guiding principles.

3.2.2 Feasibility

The State CEQA Guidelines (Section 15364) define feasibility as:

> *...capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.*

The alternatives screening analysis is largely governed by what CEQA terms the "rule of reason," meaning that the analysis should remain focused, not on every possible eventuality, but rather on the alternatives necessary to permit a reasoned choice. Those alternatives that are potentially feasible, while still meeting most of the project objectives, will be fully analyzed in the EIR.

According to the State CEQA Guidelines (Section 15126.6(f)(1)), among the factors that may be considered when addressing the potential feasibility of alternatives include site suitability,

economic viability, availability of infrastructure, general plan consistency, other plans or other regulatory limitations, jurisdictional boundaries, and the project proponent's control over alternative sites. For the screening analysis, the potential feasibility of alternatives was assessed taking the following factors into consideration:

- **Legal Feasibility.** Does the alternative have the potential to avoid lands that have legal protection that may prohibit or substantially limit the feasibility of permitting a high-voltage transmission line? Lands that are afforded legal protections that would prohibit the construction of the project, or require an act of Congress for permitting, are considered less feasible locations for the project. These land use designations include wilderness areas, wilderness study areas, restricted military bases, airports, and Indian reservations. Information on potential legal constraints of each alternative has been compiled from laws, regulations, and local jurisdictions, as well as a review of federal, state, and local agency land management plans and policies.
- **Regulatory Feasibility.** Do regulatory restrictions substantially limit the likelihood of successful permitting of a high-voltage transmission line? Is the alternative consistent with regulatory standards for transmission system design, operation, and maintenance?
- **Technical Feasibility.** Is the alternative potentially feasible from a technological perspective, considering available technology? Are there any construction, operation, or maintenance constraints that cannot be overcome?
- **Economic Feasibility.** Is the alternative so costly that implementation would be prohibitive? The State CEQA Guidelines require consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of the project objectives, or would be more costly" (CEQA Guidelines Section 15126.6(b)). The Court of Appeals determined in Citizens of Goleta Valley v. Board of Supervisors (2nd Dist. 1988) 197 Cal.App.3d 1167, p. 1181 (see also Kings County Farm Bureau v. City of Hanford (5th Dist. 1990) 221 Cal.App.3d 692, 736): "[t]he fact that an alternative may be more expensive or less profitable is not sufficient to show that the alternative is financially infeasible. What is required is evidence that the additional costs or lost profitability are sufficiently severe as to render it impractical to proceed with the project."
- **Environmental Feasibility.** Would implementation of the alternative cause substantially greater environmental damage than the Proposed Project, thereby making the alternative clearly inferior from an environmental standpoint? This issue is primarily addressed in terms of the alternative's potential to eliminate significant effects of the Proposed Project.

3.2.3 Potential to Eliminate Significant Environmental Effects

A key CEQA requirement for an alternative is that it must have the potential to "avoid or substantially lessen any of the significant effects of the project" (CEQA Guidelines Section 15126.6(a)). At the screening stage, it is not possible to evaluate all of the impacts of the alternatives in comparison to the Proposed Project with absolute certainty, nor is it possible to quantify impacts. It is possible to identify elements of an alternative that are likely to be the sources of impacts and to relate them, to the extent possible, to general conditions in the subject area.

3.3 PUBLIC UTILITIES CODE CONSIDERATIONS FOR ALTERNATIVES

In considering SDG&E's application for a CPCN, CPUC will be guided by the Public Utilities Code in addition to the requirements of CEQA. Public Utilities Code Section 1002 states that:

> *(a) The commission, as a basis for granting any certificate pursuant to Section 1001 shall give consideration to the following factors:*
>
> *(1) Community values.*
>
> *(2) Recreational and park areas.*
>
> *(3) Historical and aesthetic values.*
>
> *(4) Influence on environment, except that in the case of any line, plant, or system or extension thereof located in another state which will be subject to environmental impact review pursuant to the National Environmental Policy Act of 1969 (Chapter 55 (commencing with Section 4321) of Title 42 of the United States Code) or similar state laws in the other state, the commission shall not consider influence on the environment unless any emissions or discharges therefrom would have a significant influence on the environment of this state.*

CPUC will consider the "community values" as expressed in CPUC's proceeding on the project and in comments on the Draft EIR. CPUC anticipates that the final decision will represent a reasonable balancing of the communities' interests, the need to protect environmental resources in the area, and the need for the project.

4 ALTERNATIVES DESCRIPTIONS AND DETERMINATIONS

The alternatives described in detail in this section include transmission pole relocation alternatives, transmission line routing alternatives, and electrical system alternatives. Each alternative was evaluated using considerations described in Section 3.

If a potential alternative would be unable to meet the basic project objectives; would be infeasible; or would not reduce or avoid significant impacts of the Proposed Project, then it was eliminated from full evaluation. Alternatives that were determined to meet the CEQA alternatives screening criteria were retained for full analysis in the EIR.

Sections 4.2 through 4-8 describe each alternative, the consideration of CEQA criteria, and the conclusions for alternative elimination or retention. Retained alternatives are addressed in Sections 4.2 and 4.3. Eliminated alternatives are addressed in Sections 4.4 through 4.8. The No Project Alternative is required to be considered in an EIR by CEQA, so it is described in Chapter 3: Alternatives, of the EIR and is not discussed in this Alternatives Screening Report.

4.1 SUMMARY OF ALTERNATIVES SCREENING ANALYSIS

Five of the 41 alternatives are recommended for further analysis in the EIR. Table 4.1-1 summarizes the results of the screening analysis presented in Sections 4.2 and 4.3.

Table 4.1-1 Summary of Alternatives Screening Analysis

Description of Alternative	Project Objectives	Potential Feasibility	Avoid/Reduce Environmental Effects	Alternative Type
Alternatives Retained				
Alternative 1b: Eastern Cable Pole at Carmel Valley Road Alternate option for cable pole P41 at the eastern end of Segment B. The alternative would use a single cable pole immediately south of Carmel Valley Road rather than the three-pole structure considered by SDG&E in the PEA. Source: CPUC	Meets all project objectives	Meets feasibility criteria	Meets environmental feasibility criteria; reduces visual and recreation impacts to Black Mountain Ranch Community Park	Cable Pole Relocation
Alternative 2a: Eastern Cable Pole with Underground Alignment through City Open Space Alternate option for cable pole P41 at the eastern end of Segment B. The cable pole would be located south of Carmel Valley Road in line with the first existing H-frame structure. From this location, the underground line would be routed west and north for about 1,000 feet primarily along an unpaved existing access road and open space areas to Carmel Valley Road. Source: CPUC	Meets all project objectives	Meets feasibility criteria	Meets environmental feasibility criteria; reduces visual and recreation impacts to Black Mountain Ranch Community Park	Cable Pole Relocation
Alternative 2b: Eastern Cable Pole with Underground Alignment in City Utility Access Road Alternative option for cable pole P41 at the eastern end of Segment B. The cable pole would be in the same location as Alternative 2a, above. From the cable pole, the underground	Meets all project objectives	Meets feasibility criteria	Meets environmental feasibility criteria; reduces visual and recreation impacts to Black Mountain Ranch Community Park	Cable Pole Relocation

Description of Alternative	Project Objectives	Potential Feasibility	Avoid/Reduce Environmental Effects	Alternative Type
transmission line would be located within open space and an existing City of San Diego water utility access road to Carmel Valley Road. Source: CPUC				
Alternative 3: Los Peñasquitos Canyon Preserve-Mercy Road Underground Alternative Follows Segment A to an existing ROW along Scripps Poway Parkway in the vicinity of Ivy Hill Drive. From there, the transmission line would transition to underground and continue west on Scripps Poway Parkway/Mercy Road. The line would continue under Mercy Road to Black Mountain Road. At Black Mountain Road, the line would remain underground heading north then west at Park Village Drive where the line would travel through SDG&E ROW in Los Peñasquitos Canyon to Peñasquitos Junction. Source: Sunrise Powerlink EIR/EIS	Meets all project objectives	Meets feasibility criteria	Meets environmental feasibility criteria; reduces biological, cultural, aesthetic, and land use impacts	Transmission Route
Alternative 4: Segment D 69-kV Partial Underground Alignment Replaces a 2.6-mile portion of the proposed overhead Segment D with two 69-kV underground transmission lines; avoids installing the double-circuit 69-kV poles along Los Peñasquitos Canyon Preserve. Source: CPUC	Meets all project objectives	Meets feasibility criteria	Meets environmental feasibility criteria; reduces aesthetic, biological, cultural, and land use impacts	Transmission Route

Description of Alternative	Project Objectives	Potential Feasibility	Avoid/Reduce Environmental Effects	Alternative Type
Alternative 5: Pomerado Road to Miramar Area North Combination Underground/Overhead Alternative Follows Segment A for approximately 1 mile, then transitions to underground for approximately 11 miles along Pomerado Road to I-15 and industrial roads to Carroll Canyon Road; transitions to overhead near I-805 and locates the transmission line on existing TSPs within SDG&E ROW to Peñasquitos Substation. Source: Sunrise Powerlink EIR/EIS	Meets all project objectives	Meets feasibility criteria	Meets environmental feasibility criteria; reduces biological, cultural, and aesthetic impacts	Transmission Route
Alternatives Eliminated				
Alternative 1a: Eastern Cable Pole Option 1a Alternate option for cable pole P41 at the eastern end of Segment B. The alternative would use three pole structures south of Carmel Valley Road. Source: SDG&E Application/PEA	Meets all project objectives	Meets feasibility criteria	Meets environmental feasibility criteria. Reduces visual and recreation impacts to Black Mountain Ranch Community Park; however, SDG&E's low profile three pole alternative is more bulky and visually impactful than the Alternative 1b. Therefore Alternative 1b is retained above and Alternative 1a is eliminated.	Cable Pole Relocation
Alternative 6: Eastern Cable Pole Option 2 Alternate option for cable pole P41 within Black Mountain Ranch Community Park Source: SDG&E Response to Data Request #1	Meets all project objectives	Meets feasibility criteria	Does not meet environmental feasibility criteria; results in greater impacts to recreation	Cable Pole Relocation

Description of Alternative	Project Objectives	Potential Feasibility	Avoid/Reduce Environmental Effects	Alternative Type
Alternative 7: Western Cable Pole Alternative Alternate option for cable pole P42 at the western end of Segment B. The alternative would use a double-circuit monopole structure north of Carmel Valley Road within the Evergreen Nursery. Source: SDG&E Application/PEA	Meets all project objectives	Meets all feasibility criteria	Does not meet environmental feasibility criteria; requires additional structures and does not reduce environmental impacts.	Cable Pole Relocation
Alternative 8: Segment A Pole Relocations Minor relocation of P5, P17 through P21, P24, and P34 in Segment A Source: CPUC	Meets all project objectives	Meets all feasibility criteria	Does not meet environmental feasibility criteria because the pole relocations would not measurably reduce any significant impacts of the Proposed Project	Pole Relocation
Alternative 9: Segment D Pole Relocations South of Existing Line Relocation of poles P48 through P57 in Segment D to a position approximately 30 feet south of the Proposed Project location Source: Public Scoping	Meets all project objectives	Meets all feasibility criteria	Does not meet environmental feasibility criteria because the alternative would not measurably reduce any significant impacts of the Proposed Project and impacts to biological resources would increase due to construction within a Multiple Species Conservation Program (MSCP) Preserve	Pole Relocation
Alternative 10: Northern Alignment Number 1 27.66 miles long, extends further north than the Proposed Project alignment, and replaces Segment B with an alternative overhead alignment located north of Carmel Valley Road. Source: SDG&E Application/PEA	Meets all project objectives	Meets all feasibility criteria	Does not meet environmental feasibility criteria due to greater impacts to aesthetic, biological, and cultural resources, and would cause temporary construction impacts associated with air quality, greenhouse gases, noise, public services, and recreation	Transmission Route

Description of Alternative	Project Objectives	Potential Feasibility	Avoid/Reduce Environmental Effects	Alternative Type
Alternative 11: Route Alternative 5 - Northern Alignment Number 2 25.09 miles long, extends further north than the Proposed Project alignment, and replaces Segment B with an alternative overhead alignment located north of Carmel Valley Road. Source: SDG&E Application/PEA	Meets all project objectives	Meets all feasibility criteria	Does not meet environmental feasibility criteria due to greater impacts to aesthetic, biological, and cultural resources, and would cause an increase in temporary construction impacts associated with air quality, greenhouse gases, noise, public services, and recreation because of the extended length of the alternative	Transmission Route
Alternative 12: Northern Alignment Number 3 23.62 miles long, extends further north than the Proposed Project alignment, and replaces Segment B with an alternative alignment (overhead and some limited underground) located north of Carmel Valley Road. Source: SDG&E Application/PEA	Meets all project objectives	Meets all feasibility criteria	Does not meet environmental feasibility criteria due to greater impacts to aesthetic, biological, and cultural resources, and would cause an increase in temporary construction impacts associated with air quality, greenhouse gases, noise, public services, and recreation because of the extended length of the alternative	Transmission Route
Alternative 13: Northern Alignment Number 4 21.6 miles long, extends further north than the Proposed Project alignment, and replaces Segment B with an alternative alignment (overhead and some limited underground) located north of Carmel Valley Road. Source: SDG&E Application/PEA	Meets all project objectives	Meets all feasibility criteria	Does not meet environmental feasibility criteria due to greater impacts to aesthetic, biological, and cultural resources, and would cause an increase in temporary construction impacts associated with air quality, greenhouse gases, noise, public services, and recreation because of the extended length of the alternative	Transmission Route

Description of Alternative	Project Objectives	Potential Feasibility	Avoid/Reduce Environmental Effects	Alternative Type
Alternative 14: Southern Alignment Number 5 12.8 miles long, would not extend further north than the existing Chicarita Substation, and would replace Segments B and C with an alternative overhead alignment located south of SR-56. Source: SDG&E Application/PEA	Meets all project objectives	Regulatory feasibility is uncertain due to land use designations and the presence of sensitive biological resources	Does not meet environmental feasibility criteria; significant and unavoidable impacts to vernal pools and potential impacts to other sensitive biological resources	Transmission Route
Alternative 15: Southern Alignment Number 6 *13.43 miles long, would not extend further north than the existing Chicarita Substation, and would replace Segments B and C with an alternative underground alignment located south of SR-56.* Source: SDG&E Application/PEA	Meets all project objectives	Regulatory feasibility is uncertain due to the presence of sensitive biological resources and land use designations	Does not meet environmental feasibility criteria. Increased land use and visual impacts. Significant and unavoidable impacts to vernal pools and potential impacts to other sensitive biological resources	Transmission Route
Alternative 16: Underground Alignment Number 7 15.27 miles long, all underground, connecting the Sycamore Canyon and Peñasquitos Substations with a new, single-circuit underground 230-kV transmission line utilizing public roadways to the greatest extent possible. Source: SDG&E Application/PEA	Meets all project objectives	Does not meet regulatory or legal feasibility criteria due to new ROW on MCAS Miramar	May meet environmental feasibility criteria	Transmission Route
Alternative 17: Stonebridge-Mira Mesa Alignment Follows Segment A from Sycamore Canyon Substation for a short distance, then transitions underground and follows existing roadways until just	Meets all project objectives	Meets all feasibility criteria	Does not meet environmental feasibility criteria due to substantially greater impacts on transportation and traffic	Transmission Route

Description of Alternative	Project Objectives	Potential Feasibility	Avoid/Reduce Environmental Effects	Alternative Type
before I-805. At Vista Sorrento Parkway, the line transitions to overhead and follows an existing SDG&E ROW to Peñasquitos Substation. Source: CPUC				
Alternative 18: Los Rosas-Park Village Alignment Follows Segment A from Sycamore Canyon Substation to Chicarita Substation, then transitions underground and follows existing roadways to Peñasquitos Junction, where the line transitions overhead and follows Segment D. Source: CPUC	Meets all project objectives	Meets all feasibility criteria	Does not meet environmental feasibility criteria; increases land use, traffic, and hazards due to construction in narrow roads in a residential area	Transmission Route
Alternative 19: Sunrise Coastal Link Alignment Follows Segment A for approximately 6 miles, then transitions underground for approximately 1.6 miles to Park Village Road. Follows Park Village Road 1 mile to the Los Peñasquitos Canyon Preserve, then follows a trail for about 1.5 miles before transitioning overhead near Peñasquitos Junction and following Segment D as proposed. Source: Sunrise Powerlink EIR/EIS	Meets all project objectives	Meets feasibility criteria	Does not meet environmental feasibility criteria due to greater impacts to land use, public health and safety, noise, and recreation	Transmission Route
Alternative 20: Pomerado Road to Miramar Road Combination Underground/Overhead Alternative Follows Segment A for approximately 1 mile, then transitions to underground for approximately 10 miles along Pomerado Road, Miramar Road, and Carroll Canyon Road; transitions to	Meets all project objectives	Meets feasibility criteria	Does not meet environmental feasibility criteria due to substantially greater impacts on transportation and traffic	Transmission Route

Description of Alternative	Project Objectives	Potential Feasibility	Avoid/Reduce Environmental Effects	Alternative Type
overhead near I-805 and locates the transmission line on existing TSPs within SDG&E ROW to Peñasquitos Substation. Source: Sunrise Powerlink EIR/EIS				
Alternative 21: Mannix-Dormouse Road Alternative *Follows Segment A to Chicarita Substation, then travels west overhead and connects to Segment D. This alternative follows a path north of and adjacent to single family residences along Mannix and Dormouse Roads in Rancho Peñasquitos.* Source: Sunrise Powerlink EIR/EIS	Meets all project objectives	Meets feasibility criteria	Does not meet environmental feasibility criteria due to greater impacts to critical habitat and vernal pools	Transmission Route
Alternative 22: SDG&E Segment 13 Scripps Ranch Alternative Alternative alignment would run parallel to existing SDG&E ROW from Sycamore Canyon Substation to the Scripps Substation, and then would terminate at Peñasquitos Substation. The portion of the line from Scripps Substation to Peñasquitos Substation would follow Pomerado Road. Source: Sunrise Powerlink EIR/EIS	Meets all project objectives	Legal and regulatory infeasibility due to approval of new ROW on MCAS Miramar	Does not meet environmental feasibility criteria due to greater impacts to aesthetics, land use, and hazards	Transmission Route
Alternative 23: MCAS Miramar – Underground/Overhead Alternative Underground through MCAS Miramar from Sycamore Canyon Substation to I-805 then north to Peñasquitos Substation. Source: Sunrise Powerlink EIR/EIS	Meets all project objectives	Legal and regulatory infeasibility due to crossing of MCAS Miramar	Meets environmental feasibility criteria; reduced aesthetic impacts	Transmission Route

Description of Alternative	Project Objectives	Potential Feasibility	Avoid/Reduce Environmental Effects	Alternative Type
Alternative 24: MCAS Miramar – Combination Underground/Overhead Alternative Overhead line through MCAS Miramar to Pomerado Road, transitioning to underground along Pomerado Road and along MCAS Miramar to I-805, then north to Peñasquitos Substation. Source: Sunrise Powerlink EIR/EIS	Meets all project objectives	Legal and regulatory infeasibility due to crossing of MCAS Miramar	Meets environmental feasibility criteria; reduced aesthetic impacts	Transmission Route
Alternative 25: Rancho Peñasquitos Boulevard Bike Path Alternative Follows Segment A to Chicarita Substation, then transitions to underground and follows SR-56 to SDG&E ROW west through Los Peñasquitos Canyon Preserve and Peñasquitos Junction. Follows Segment D to Peñasquitos Substation. Source: Sunrise Powerlink EIR/EIS	Meets all project objectives	Infeasible due to Caltrans regulations	Does not meet environmental feasibility criteria; does not reduce impacts	Transmission Route
Alternative 26: State Route 56 Alternative Follows Segment A, then transitions underground near Rancho Peñasquitos Boulevard at the SR-56 overpass. The transmission line would be located under the median of SR-56 until it would reach existing overhead lines north of the western terminus of Park Village Drive. The line would continue south overhead along this existing ROW until rejoining Segment D as proposed. Source: Sunrise Powerlink EIR/EIS	Meets all project objectives	Infeasible due to Caltrans regulations	Does not meet environmental feasibility criteria; does not reduce impacts	Transmission Route

Description of Alternative	Project Objectives	Potential Feasibility	Avoid/Reduce Environmental Effects	Alternative Type
Alternative 27: MP 146.5 to Peñasquitos Substation Underground/Consolidation Alternative Line would follow Segment A to Chicarita Substation, and then would run underground to Peñasquitos Substation. Alternative includes undergrounding and consolidating all existing electrical 69-kV and 138-kV transmission lines along the segment from Peñasquitos Junction to Peñasquitos Substation, including H-frame structures and lattice towers. Source: Sunrise Powerlink EIR/EIS	Meets all project objectives	Legally infeasible because it involves burying existing lines that are not a part of the project	Meets environmental feasibility criteria; reduces aesthetic and land use impacts	Transmission Route
Alternative 28: Scripps Poway Parkway to State Route 56 Alternative From Sycamore Canyon Substation, the line would transition underground beneath Scripps Poway Parkway and continue toward the Chicarita Substation and SR-56. The line would remain underground and would be located beneath SR-56. The line would continue westward under SR-56 and could turn south at either of the two existing transmission line corridors that intersect SR-56. The route would head south along an existing ROW into Peñasquitos Substation. Source: Sunrise Powerlink EIR/EIS	Meets all project objectives	Infeasible due to Caltrans regulations	Does not meet environmental feasibility criteria; does not reduce impacts	Transmission Route
Alternative 29: Scripps Poway Parkway-Pomerado Road Underground Alternative Follows Segment A to Pomerado Road, then transitions underground beneath Pomerado Road, heading northward to	Meets all project objectives	Meets legal, regulatory, and technical feasibility criteria	Does not meet environmental feasibility criteria; does not reduce impacts	Transmission Route

Description of Alternative	Project Objectives	Potential Feasibility	Avoid/Reduce Environmental Effects	Alternative Type
Poway Road. At Poway Road, the line would continue underground in a westerly direction where it would rejoin Segment A as proposed heading into Chicarita Substation. Source: Sunrise Powerlink EIR/EIS				
Electrical System Alternatives (wire)				
Alternative 30: CAISO Approved Mission–Peñasquitos 230-kV Transmission Line New 230-kV transmission line from Peñasquitos Junction to Peñasquitos Substation. Source: ORA; CAISO	Does not meet project objectives for delivering energy efficiently to the load center or increasing deliverability of renewable energy	Potentially feasible	Meets environmental feasibility criteria; would avoid impacts in segments A, B, and C of the Proposed Project	Electrical System
Alternative 31: CAISO-Approved Mission–Peñasquitos 230-kV Transmission Line and New Sycamore – Mission 230-kV Transmission Line New 230-kV transmission line in the Sycamore – Mission transmission corridor through MCAS Miramar and a new 230-kV transmission line between Mission Substation and Peñasquitos Substation. Source: CPUC	Meets all project objectives	Potentially feasible	Does not meet environmental feasibility criteria; does not reduce impacts of the Proposed Project and would result in greater impacts to air quality, greenhouse gases, biological resources, cultural resources, hydrology, geology, and noise due to increased length of transmission line and increased construction duration	Electrical System
Alternative 32: Loop-in of Single Mission–San Luis Rey 230-kV Line into Peñasquitos Substation Loop-in of a Mission – San Luis Rey 230-kV transmission line from Peñasquitos Junction to Peñasquitos Substation on new 230-kV structures. Source: CPUC	Does not meet any project objectives	Potentially feasible	Potentially meets environmental criteria; avoids impacts in Segments A, B, and C of the Proposed Project	Electrical System

Description of Alternative	Project Objectives	Potential Feasibility	Avoid/Reduce Environmental Effects	Alternative Type
Alternative 33: Loop-in of Two Mission–San Luis Rey 230-kV Lines Into Peñasquitos Substation Loop-in of two 230-kV transmission lines from Peñasquitos Junction to Peñasquitos Substation on two sets of new 230-kV structures located south of the existing structures in SDG&E ROW. Source: CPUC	Does not meet any project objectives	Potentially feasible	Does not meet environmental criteria; would substantially increase aesthetic biological resource, and noise impacts in Segment D	Electrical System
Alternative 34: New Sycamore–Mission 230-kV Line and Loop-in of Single Existing Mission–San Luis Rey 230-kV Line Into Peñasquitos Substation Loop-in of a Mission–San Luis Rey 230-kV transmission line from Peñasquitos Junction to Peñasquitos Substation on new 230-kV line between Sycamore Canyon Substation and Mission Substation. Source: CPUC	Meets all objectives	Potentially feasible	Does not meet environmental criteria; would result in greater aesthetic, noise and traffic impacts in Segment D and would result in greater biological, air quality, greenhouse gas, hydrology, and geology impacts due to additional tower replacements and construction relative to the Proposed Project.	Electrical System
Alternative 35: New Mission–Peñasquitos 230-kV Line and Reconfigured and Reconductored Power Lines Involves installing a new 230-kV conductor on Segment D of the Proposed Project, reconfiguring the 69-kV transmission lines near the Miramar Substation and reconductoring the Poway-Pomerado 69-kV transmission line. Source: ORA	Does not meet project objectives; would not deliver energy more efficiently to the load center or promote deliverability of renewable energy	Potentially meets feasibility criteria	Would reduce environmental impacts by avoiding construction of Segments A, B, and C of the Proposed Project	Electrical System
Alternative 36: New Mission–Peñasquitos 230-kV, Reconductored Poway-Pomerado Line and Series Reactor	Does not meet project objectives; would not deliver energy more	Potentially meets feasibility criteria	Would reduce environmental impacts by avoiding construction of Segments A, B,	Electrical System

Description of Alternative	Project Objectives	Potential Feasibility	Avoid/Reduce Environmental Effects	Alternative Type
This alternative modifies Alternative 35 by removing the reconfiguration of the 69-kV lines near Miramar and adding a series reactor within one of the substations on the Scripps to Miramar line. Source: ORA	efficiently to the load center or promote deliverability of renewable energy		and C of the Proposed Project	
Alternative 37: Imperial Irrigation District Hoober to SONGS Line Imperial Irrigation District-proposed HVDC power line to deliver baseload geothermal and renewable power from Imperial Valley to SONGS. Source: CPUC	Alternative is too speculative to evaluate the performance relative to project objectives	Alternative is too speculative to meet feasibility criteria	Alternative is too speculative to evaluate the environmental feasibility	Electrical System
Alternative 38: Increased Generation at Carlsbad Energy Center during Peak Loads Generation of additional power during peak-loading at Carlsbad and Encina generating facilities. Source: CPUC	Does not meet project objectives; would result in additional overloads	Meets feasibility criteria	May not meet environmental criteria; would require other upgrades to address overloads with other environmental impacts	Non-Wire
Alternative 39: In-Area Distributed Generation (Renewables) Generation of renewable power to offset peak loading and improve reliability. Source: Public Scoping; Public Utilities Code 1002.3	Does not meet project objectives	Meets feasibility criteria	Meets environmental criteria; eliminates all impacts associated with the project	Non-wire
Alternative 40: Energy Efficiency and Conservation Increase energy efficiency and conservation to reduce system loading and demand for power.	Does not meet project objectives	Meets feasibility criteria	Meets environmental criteria; eliminates all impacts associated with the project	Non-wire

Description of Alternative	Project Objectives	Potential Feasibility	Avoid/Reduce Environmental Effects	Alternative Type
Source: Public Scoping; Public Utilities Code 1002.3				
Alternative 41: Demand Response Reduce demand/electricity use during periods of peak energy use Source: CPUC; Public Utilities Code 1002.3	Does not meet project objectives	Meets feasibility criteria	Meets environmental criteria; eliminates all impacts associated with the project	Non-wire

4.2 CABLE POLE ALTERNATIVES RETAINED

Figure 4.2-1 shows the locations of cable pole alternatives that are retained for further analysis.

4.2.1 Alternative 1: Eastern Cable Pole Option 1b at Carmel Valley Road (SDG&E Application; CPUC)

4.2.1.1 Description

Eastern Cable Pole Option 1b at Carmel Valley Road is an alternate option for cable pole P41—the cable pole that would be used to transfer the transmission line from overhead to underground at the eastern end of Segment B. Instead of a using a 150-foot tall tubular steel cable pole north of Carmel Valley Road at the northern end of Black Mountain Ranch Community Park as proposed, the Eastern Cable Pole Option 1b at Carmel Valley Road would use a single tubular steel cable pole approximately 150 feet high located immediately south of Carmel Valley Road within the existing SDG&E ROW. This is an alternative design to SDG&E's alternative three-cable-pole structure that was included in the PEA and described as Alternative 1a in Section 4.4.1 below.

Eastern Cable Pole Option 1b would replace an existing single-circuit wood H-frame structure approximately 83 feet in height that currently supports TL 13825. Eastern Cable Pole Option 1b would require a shorter underground segment compared to the Proposed Project because it would not require an underground line and splice vault within the driveway and parking area at Black Mountain Ranch Community Park.

4.2.1.2 Consideration of CEQA Criteria

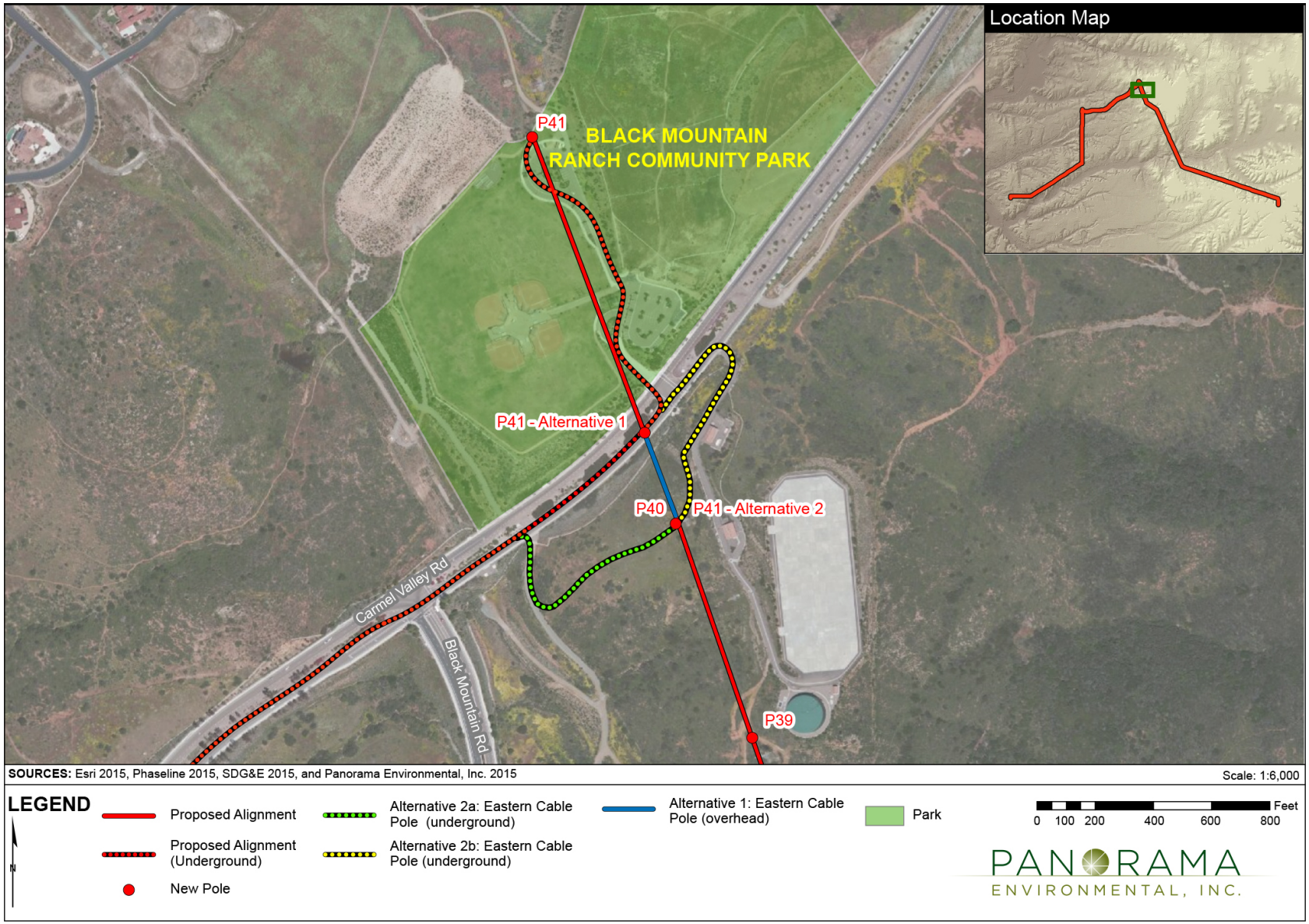
Project Objectives

Eastern Cable Pole Option 1b at Carmel Valley Road would meet all project objectives because it would construct a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations, comparable to the Proposed Project.

Technical, Legal, and Regulatory Feasibility

This alternative would potentially meet technical, legal, and regulatory feasibility criteria. The alternative would be constructed entirely within the SDG&E ROW where SDG&E has rights to construct overhead transmission lines. The alternative therefore meets legal and regulatory feasibility criteria. The alternative is also technically feasible because it is technically possible to construct the cable pole immediately south of Carmel Valley Road.

Figure 4.2-1 Cable Pole Alternatives Retained for Further Analysis



Environmental Feasibility

Environmental Advantages

The advantages of this alternative are associated with relocating the cable pole outside of Black Mountain Ranch Community Park. Potential environmental advantages include:

- **Recreation and Land Use.** Black Mountain Ranch Community Park is an existing sports facility that supports mainly baseball and soccer activities. Unlike the Proposed Project, Eastern Cable Pole Option 1b at Carmel Valley Road would locate the eastern cable pole outside the boundaries of Black Mountain Ranch Community Park and would therefore reduce significant and unavoidable impacts on recreational activities and access during construction.
- **Traffic and Transportation.** Eastern Cable Pole Option 1b at Carmel Valley Road would not require an underground splice vault within Black Mountain Ranch Community Park, and would therefore not result in significant parking impacts at the park.

Environmental Disadvantages

Potential environmental disadvantages of this alternative include:

- **Aesthetics.** The eastern cable pole would be approximately 150 feet high and would affect views. This would affect a different viewer group (i.e., motorists on Carmel Valley Road) than the Proposed Project cable pole in Black Mountain Ranch Community Park.
- **Transportation and Traffic.** The alternative could increase traffic hazards associated with maintenance access to the eastern cable pole due to the proximity of the cable pole and surrounding fence to Carmel Valley Road.

4.2.1.3 Conclusion

RETAINED FOR ANALYSIS. Eastern Cable Pole Option 1b at Carmel Valley Road meets the project objectives and meets all feasibility criteria. The alternative would reduce significant and unavoidable impacts to recreation and traffic and transportation (i.e., loss of parking) in Black Mountain Ranch Community Park without resulting in substantially greater environmental impacts. This alternative has, therefore, been retained for full analysis in the EIR.

4.2.2 Alternative 2a: Eastern Cable Pole Option with Underground Alignment in City Open Space (CPUC)

4.2.2.1 Description

This alternative is an alternate option for cable pole P41—the cable pole that would be used to transfer the transmission line from overhead to underground at the eastern end of Segment B. Instead of using a double-circuit monopole structure about 350 feet north of Carmel Valley Road within Black Mountain Ranch Community Park, the alternative would use a cable pole just south of Carmel Valley Road at the approximate location of the first proposed TSP within existing SDG&E ROW. From this location, the underground line heads southwest following the approximate alignment of an existing unpaved access road for 600 feet to a main access road (an extension of Emden Road) and follows this road for approximately 400 feet to Carmel Valley

Road. The underground alignment would travel through City of San Diego dedicated park land and Multiple Species Conservation Plan (MSCP) open space areas near Emden Road and Carmel Valley Road.

4.2.2.2 Consideration of CEQA Criteria

Project Objectives
The Eastern Cable Pole Option with Underground Alignment in the City Open Space would meet all project objectives by constructing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations, similar to the Proposed Project.

Technical, Legal, and Regulatory Feasibility
This alternative is potentially technically and legally feasible. While the transmission line alignment between the eastern cable pole and Carmel Valley Road would be located in dedicated parkland, the City has allowed underground utilities within parkland in the past when such utilities did not interfere with the intended dedicated parkland recreational uses (per City Attorney Memorandum of Law ML-90-17).

The alternative involves constructing an underground transmission line through a City MSCP Preserve. The alternative meets regulatory feasibility criteria because SDG&E could mitigate for impacts within the MSCP Preserve consistent with the City's MSCP.

Environmental Feasibility
Environmental Advantages
The advantages of this alternative are associated with relocating the cable pole outside of Black Mountain Ranch Community Park. Potential environmental advantages include:

- **Recreation and Land Use.** Black Mountain Ranch Community Park is an existing sports facility that supports mainly baseball and soccer activities. Unlike the Proposed Project, the Eastern Cable Pole Option with Underground Alignment in City Open Space would locate the eastern cable pole outside the boundaries of Black Mountain Ranch Community Park and would therefore reduce significant and unavoidable impacts on recreational activities and access during construction.
- **Aesthetics.** The eastern cable pole would be set back from Carmel Valley Road and would not be highly visible from Black Mountain Ranch Community Park. The eastern cable pole location would therefore reduce impacts on sensitive viewers in the park and on the adjacent open space trails. The eastern cable pole would be at a distance of approximately 0.5 mile and screened by topography from the residential areas to the south.
- **Traffic and Transportation.** The alternative would not require an underground splice vault within Black Mountain Ranch Community Park and would therefore not result in significant park access or parking impacts.

Environmental Disadvantages
This alternative would require more underground construction in the Black Mountain Ranch MSCP Preserve than the Proposed Project. The alternative would result in slightly greater impacts to the City MSCP Preserve.

4.2.2.3 Conclusions
RETAINED FOR ANALYSIS. The alternative meets all of the project objectives and all feasibility criteria while reducing significant recreation, land use, aesthetics, and traffic and transportation impacts of the Proposed Project. This alternative has, therefore, been retained for full analysis in the EIR.

4.2.3 Alternative 2b: Eastern Cable Pole Option with Underground Alignment in City Utility Access Road (CPUC)

4.2.3.1 Description
This alternative is an alternate option for cable pole P41—the cable pole that would be used to transfer the transmission line from overhead to underground at the eastern end of Segment B. Instead of a using a double-circuit monopole structure about 350 feet north of Carmel Valley Road within Black Mountain Ranch Community Park as proposed, the alternative would use a cable pole south of Carmel Valley Road at the approximately location of the first proposed TSP within existing SDG&E ROW (i.e., the same location as the cable pole in Alternative 2a, above). From this location, the underground line would be routed northeast for about 250 feet within the SDG&E ROW, then would turn east for about 110 feet to the paved service road within the City of San Diego's Black Mountain Reservoir facility north of the ROW. The underground transmission line would be located within this road for approximately 350 feet to Carmel Valley Road.

4.2.3.2 Consideration of CEQA Criteria

Project Objectives
This alternative would meet all project objectives. This alternative allows for construction of a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations, comparable to the Proposed Project.

Technical, Legal, and Regulatory Feasibility
This alternative is potentially technically feasible, but may require installing the underground transmission line at greater depths (11 to 15 feet) than typical in order to pass beneath the City of San Diego's existing large water mains. This alternative appears to potentially meet regulatory and legal feasibility criteria. SDG&E would need to obtain a modification to their access easement with the City of San Diego to include rights to construct and maintain the underground segment within the reservoir facility service road.

Environmental Feasibility
Environmental Advantages
The advantages of this alternative are associated with relocating the eastern cable pole outside of Black Mountain Ranch Community Park. Potential environmental advantages include:

- **Recreation and Land Use.** Black Mountain Ranch Community Park is an existing sports facility that supports mainly baseball and soccer activities. Unlike the Proposed Project, Alternative 2b would locate the eastern cable pole outside the boundaries of Black Mountain Ranch Community Park and would therefore reduce significant and unavoidable impacts on recreational activities and access during construction.
- **Aesthetics.** The cable pole would be set back from Carmel Valley Road and would not be highly visible from Black Mountain Ranch Community Park. The eastern cable pole location would therefore reduce impacts on sensitive viewers in the park and on the adjacent open space trails. The cable pole would be at a distance of approximately 0.5 mile and screened by topography from the residential areas to the south.
- **Traffic and Transportation.** Alternative 2b would not require an underground splice vault within Black Mountain Ranch Community Park, and would therefore not result in significant park access or parking impacts.

Environmental Disadvantages

A potential environmental disadvantage is:

- **Utilities.** Because this alternative involves construction of a transmission line in proximity to other buried utilities, the transmission line could result in impacts to other utilities if not properly designed or constructed and could result in greater AC induced currents on parallel buried utility pipelines.

4.2.3.3 Conclusions

RETAINED FOR ANALYSIS. This alternative would meet all of the project objectives and would reduce significant recreation, aesthetic, and traffic environmental impacts of the Proposed Project. The alternative meets legal, regulatory, and technical feasibility criteria. This alternative has therefore been retained for full analysis in the EIR.

4.3 ROUTING ALTERNATIVES RETAINED

Figure 4.3-1 shows the locations of routing alternatives that are retained for further analysis in the EIR.

4.3.1 Alternative 3: Los Peñasquitos Canyon Preserve-Mercy Road Alternative (Sunrise Powerlink EIR/EIS)

4.3.1.1 Description

The Los Peñasquitos Canyon Preserve-Mercy Road Alternative includes 5.9 miles of underground construction from Scripps Poway Parkway along Segment A to approximately Peñasquitos Junction. The Los Penasquitos Canyon Preserve-Mercy Road Alternative was suggested by the West Chase Homeowners Associated (WCHOA) and the Rancho Penasquitos Concerned Citizens (RPCC) during preparation of Sunrise Powerlink Project EIS/EIR (CPUC and BLM 2008). This alternative avoids 6.4 miles of overhead transmission line construction in

Segments A and C. The Los Peñasquitos Canyon Preserve-Mercy Road Alternative follows Segment A to approximately Ivy Hill Drive. From there, the line would transition underground and follow Ivy Hill Drive south to Scripps-Poway Parkway and continue west on Scripps Poway Parkway/Mercy Road. The line would continue under Mercy Road to Black Mountain Road. At Black Mountain Road, the line would remain underground heading north then turn west onto Park Village Drive. The underground transmission line would continue to the end of Park Village Drive to cable pole P43 in the area of Peñasquitos Junction, where it would transition back to overhead in Segment D.

4.3.1.2 Consideration of CEQA Criteria

Project Objectives
This alternative would meet all project objectives. The Los Peñasquitos Canyon Preserve-Mercy Road Alternative would construct a new transmission line between Sycamore Canyon and Peñasquitos Substations that would be comparable to the Proposed Project.

Technical Feasibility
This alternative is routed from Ivy Hill Drive within Scripps Poway Parkway, Mercy Road, Black Mountain Road and Park Village Road. Scripps Poway Parkway, Mercy Road, and Black Mountain Road are four-lane boulevards that have center medians for approximately 3 miles. Park Village Road is a four-lane boulevard with a center median for approximately 2 miles along the eastern portion of the alternative alignment that transitions to a two-lane road for approximately 0.6 mile with parking along both sides at the western end of the alignment resulting in a road width that is similar to a four-lane road. The road width for all of these roads is 36 feet.

The Scripps Poway Parkway and Mercy Road segments contain existing utilities that occupy approximately a 15- to 18-foot width-wide section of the roadway, which provides sufficient room in the roadways to construct a new transmission line. Black Mountain Road has existing large utilities that occupy a roughly 29-footwidth-wide section of the roadway. The 7 feet of available space is also sufficient to construct the new transmission line in Black Mountain Road. Park Village Road contains utilities that occupy roughly 30 feet of the 36-foot-wide roadway. The 6 feet of space remaining in Park Village Road is sufficient to construct the underground transmission line with a 3-foot-wide duct bank. This alternative is potentially technically feasible because there is sufficient space to locate the new transmission line with the existing utilities in the roadway.

Legal and Regulatory Feasibility
The alternative would locate the transmission line within SDG&E ROW and franchise agreement area and would not conflict with any laws or regulations regarding utility locations. The alternative therefore potentially meets the criteria for legal and regulatory feasibility.

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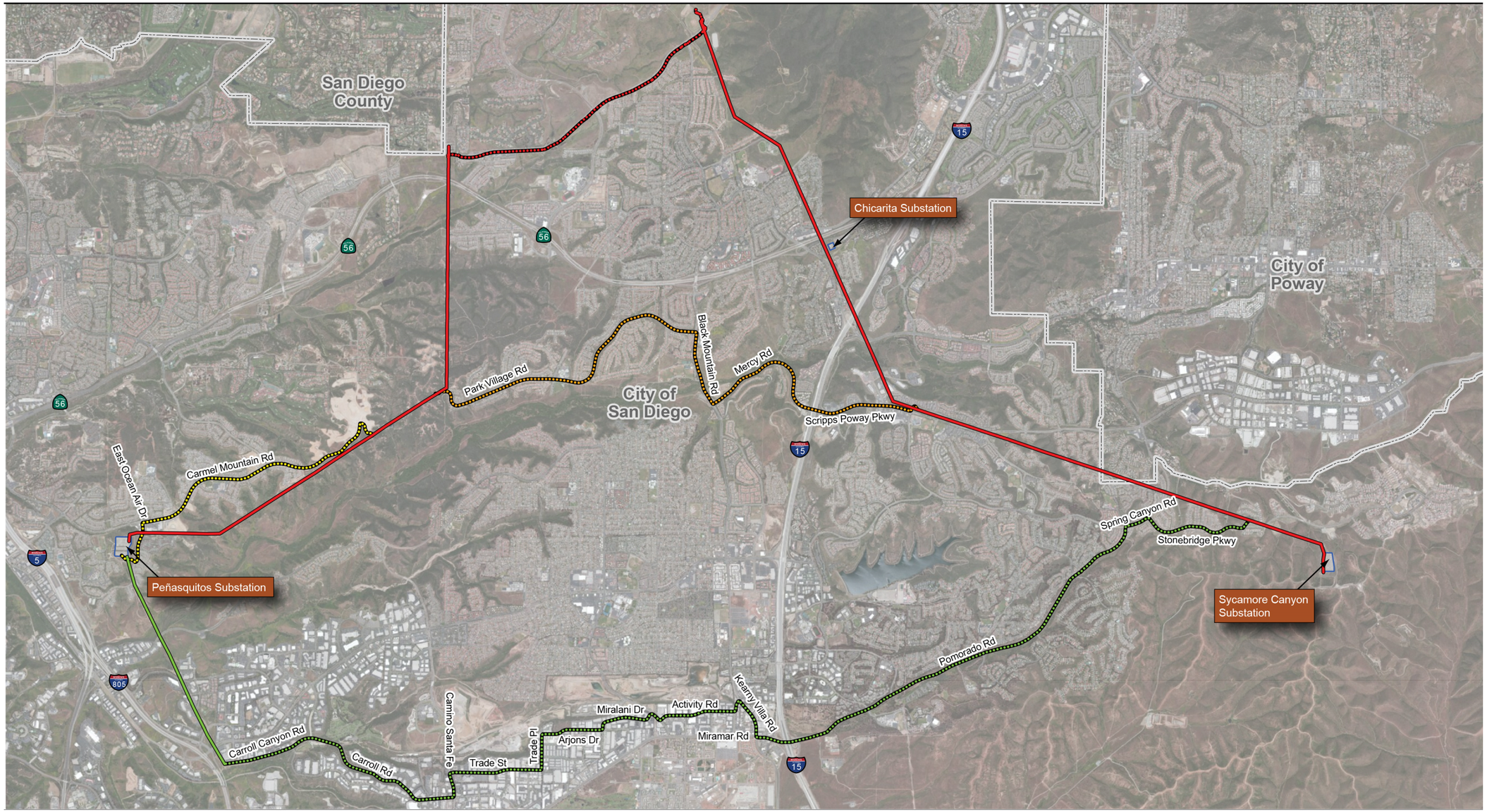
Figure 4.3-1 Routing Alternatives Retained



SOURCES: Esri 2015, SDG&E 2015, and Panorama Environmental, Inc. 2015

Scale: 1:50,000

LEGEND

- Proposed Alignment (overhead)
- Proposed Alignment (underground)
- Alternative 3: Los Penasquitos Canyon Preserve - Mercy Road Underground Alternative
- Alternative 4: Segment D 69kV Partial Underground Alignment
- Alternative 5: Pomerado Road to Miramar Area North Combination Underground/Overhead Alternative (overhead)
- Alternative 5: Pomerado Road to Miramar Area North Combination Underground/Overhead Alternative (underground)
- City Boundary

Miles: 0 0.25 0.5 1 1.5 2

PANORAMA ENVIRONMENTAL, INC.

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Environmental Feasibility

Environmental Advantages

This alternative would replace the northern portion of Segment A and all of Segments B and C with an underground transmission line. This alternative would avoid the impacts associated with construction of an overhead transmission line along portions of Segment A and all of Segment C and all of the underground of Segment B. Potential environmental advantages include:

- **Aesthetics.** Because a larger amount of the transmission line would be buried, the alternative avoids visual impacts of new TSPs and additional wires in the northern portion of Segment A and the additional conductor in Segment C.
- **Biological Resources.** This alternative would reduce impacts to sensitive habitat by avoiding construction within Black Mountain Ranch Preserve in Segment A and avoiding potential impacts to vernal pools in Segment C.
- **Land Use.** This alternative would reduce most overhead impacts in residential areas near Segment A including visual impacts, health and safety concerns, and construction effects.
- **Noise.** This alternative would reduce corona noise impacts to residences along the overhead portions of the proposed route in the northern portion of Segment A.
- **Recreation.** This alternative would avoid conflicts with constructing a cable pole in Black Mountain Ranch Community Park including temporary loss of recreational access and loss of parking.

Environmental Disadvantages

Potential environmental disadvantages include:

- **Air Quality and Greenhouse Gases.** Construction of a longer underground transmission line for an additional 2 miles would result in more intense vehicle activity; therefore, this alternative would result in greater impacts to air quality and would have more greenhouse gas emissions than the Proposed Project.
- **Utilities.** Because this alternative would involve approximately 2 more miles of underground transmission line construction than the proposed Segment B, the transmission line could result in more potential impacts to other utilities if not properly designed or constructed and could result in greater AC induced currents on parallel buried utility pipelines.
- **Traffic and Transportation.** This alternative would have increased traffic impacts due to an increase in underground construction on roadways for an additional 2 miles.
- **Cultural Resources.** The increased underground construction would have a greater potential to encounter buried cultural resources or human remains.

4.3.1.3 Conclusions

RETAINED FOR ANALYSIS. This alternative would meet the project objectives and is feasible. It has been retained because it would offer substantial avoidance of land use/visual effects to residents in the northern portion of Segment A as well as avoidance of biological impacts in portions of Segments A to C. This alternative has, therefore, been retained for full analysis in the EIR.

4.3.2 Alternative 4: Segment D 69-kV Partial Underground Alignment (Public Scoping)

4.3.2.1 Description

The Segment D 69-kV Partial Underground Alignment would replace a portion of the proposed overhead Segment D with two 69-kV underground transmission lines from the area of Del Mar Mesa to Peñasquitos Substation, requiring approximately 3.1 miles of underground construction. This alternative was recommended by several individuals during scoping for the EIR. The underground power line would begin approximately 0.4 mile west of Peñasquitos Junction (the intersection of Segments C and D). A cable pole would transition the 69-kV power lines to underground at the approximate location of cable pole P48 near a new subdivision and Carmel Mountain Road. Approximately 850 feet of the underground power lines would be located along an existing SDG&E access road to Carmel Mountain Road. The underground route would then follow and be located within Carmel Mountain Road to East Ocean Air Drive. The underground line would follow East Ocean Air Drive south for approximately 1,500 feet to the driveway entrance for Peñasquitos Substation Road. The line would enter Peñasquitos Substation underground via the driveway entrance. The 69-kV wood H-frames would be abandoned in place and would remain in Segment D. The 230-kV transmission line would be installed on the existing lattice steel tower similar to the Proposed Project between P48 and Peñasquitos Substation. This alternative avoids building the double circuit 69-kV power line on new TSPs along Los Peñasquitos Canyon Preserve.

4.3.2.2 Consideration of CEQA Criteria

Project Objectives

The alternative meets all project objectives. The Segment D 69-kV Partial Underground Alignment would construct a new transmission line between Sycamore Canyon and Peñasquitos Substations that would be comparable to the Proposed Project.

Technical Feasibility

The roadway is a relatively new two-lane road at the east end of the underground alignment where the power line enters Carmel Mountain Road and the road becomes a divided boulevard with four road lanes and a center median where Carmel Mountain Road crosses Timber Brook Lane. At the east end of Carmel Mountain Road the existing utilities occupy approximately 10 feet of the 18-foot-wide roadway. West of Timer Brook Lane, the existing utilities occupy roughly 13 feet of the 36-foot-wide road. There is sufficient room to construct the underground power lines within these roadways considering the existing utilities in the area. This alternative is potentially technically feasible.

Legal and Regulatory Feasibility

This alternative meets legal and regulatory feasibility criteria by locating the alignment in existing SDG&E ROW and franchise ROW. SDG&E would need to obtain underground rights to locate the power line within the portion of SDG&E ROW where they only have overhead rights; however, this is considered potentially feasible because there are no conflicting land uses in the area.

Environmental Feasibility

Environmental Advantages

Because this alternative would replace most of the overhead transmission line of Segment D with an underground transmission line, the impacts associated with an overhead transmission line on Segment D would be reduced. Potential environmental advantages include:

- **Aesthetics.** This alternative would reduce significant visual impacts to residents and recreationists along Segment D because no new structures would be installed between P48 and Peñasquitos Substation.
- **Biological Resources.** This alternative would reduce impacts to sensitive habitat within the Los Peñasquitos Canyon Preserve. The underground 69-kV lines would be constructed in previously disturbed roadways, unlike the Proposed Project where the 69-kV lines would be constructed on new steel poles in undisturbed habitat within a City MSCP Preserve.
- **Geology and Soils.** This alternative would reduce ground disturbance of open space habitat, which would reduce grading and avoid the need for retaining walls in Segment D.

Environmental Disadvantages

Potential environmental disadvantages of the underground 69-kV power lines include:

- **Air Quality and Greenhouse Gases.** Construction of an underground power line could result in more intensive construction activity (i.e., more equipment running simultaneously); therefore, this alternative could result in greater impacts to air quality and could generate more greenhouse gas emissions than the Proposed Project.
- **Utilities.** Because this alternative would replace most of the Segment D 69-kV TSPs with underground double-circuit 69-kV power lines parallel to other utilities, the transmission line could result in impacts to other utilities if not properly designed or constructed and could result in greater AC induced currents on parallel buried utility pipelines.
- **Traffic and Transportation.** This alternative would have increased traffic impacts during construction due to an increase in underground construction on roadways.
- **Cultural Resources.** The increased underground construction would have a greater potential to encounter buried cultural resources or human remains.

4.3.2.3 Conclusions

RETAINED FOR ANALYSIS. This alternative would meet the project objectives and is feasible. It has been retained because it would offer substantial avoidance of significant aesthetic and biological resource impacts to the community near Segment D. This alternative has, therefore, been retained for full analysis in the EIR.

4.3.3 Alternative 5: Pomerado Road to Miramar Area North Combination Underground/Overhead Alternative (Sunrise Powerlink EIR/EIS)

4.3.3.1 Description

The Pomerado Road to Miramar Area North Combination Underground/Overhead Alternative would run overhead between Sycamore Canyon Substation and Stonecroft Trail within existing ROW. From there, the route would travel underground beneath Stonebridge Parkway to the west. The route would continue underground and turn south on Pomerado Road. The line would transition to overhead via a cable pole directly east of I-15 and would cross I-15 in an overhead position. The line would then transition back to underground via a cable pole directly west of I-15. The route would continue westward under Miramar Road, turn north on Kearny Villa Road, west on Black Mountain Road, and west on Activity Road to Camino Ruiz. The line would continue underground north under Camino Ruiz, west on Miralani Drive, west on Arjons Drive, south on Trade Place, west on Trade Street, south on Camino Santa Fe, and west on Carroll Road/Carroll Canyon Road to Scranton Road. From this point the line would continue west for approximately 400 feet behind commercial buildings and near an existing transmission pole. At this location the line would transition to overhead and would be located within the existing 230-kV ROW on existing 230-kV TSPs heading northward into the Peñasquitos Substation. Approximately 2.8 miles of the transmission line would be overhead (0.7 mile in Segment A and 2.1 miles within SDG&E ROW from Scranton Road to Peñasquitos Substation) and 11.5 miles would be underground.

4.3.3.2 Consideration of CEQA Criteria

Project Objectives

The alternative meets all project objectives. The Pomerado Road to Miramar Area North Combination Underground/Overhead Alternative would construct a new transmission line between Sycamore Canyon and Peñasquitos Substations that would be comparable to the Proposed Project.

Technical Feasibility

Stonebridge Parkway is a four-lane boulevard with a center median. Pomerado Road has two travel lanes, a bike lane, and a shoulder, so it has the same width as a three-lane road. Miramar Road is a major thoroughfare with six travel lanes plus a turn lane. The industrial roads north of Miramar Road are two-lane roads with parking on each side resulting in a road width that is equivalent to a four-lane road.

The underground utilities in Stonebridge Parkway occupy roughly 21 feet of the 36-foot-wide roadway. The utilities in Pomerado Road occupy roughly 14 to 17 feet of the 27-foot-wide

roadway. The utilities in the industrial area north of Miramar Road occupy roughly 17 to 24 feet of the 36-foot-wide road. This alternative appears to be potentially feasible because there is sufficient room for construction of the underground transmission line within the roadways.

Legal and Regulatory Feasibility
The alternative potentially meets the regulatory and legal feasibility criteria by locating the transmission line in existing franchise ROW or SDG&E ROW and crossing I-15 in an overhead position.

Environmental Feasibility
Environmental Advantages
Potential environmental advantages include:

- **Aesthetics.** This alternative would avoid aesthetic impacts from new poles and overhead transmission line wires and marker balls in Segments A, C, and D.
- **Biological Resources.** This alternative would avoid impacts to biological resources contained within Segments A, C, and D including the Black Mountain Ranch, Del Mar Mesa, and Los Peñasquitos Canyon Preserves.
- **Geology and Soils.** This alternative would reduce grading and the need for retaining walls.
- **Land Use.** This alternative would not construct most of the overhead transmission line in Segment A and none of the transmission line in Segments B, C, and D. This alternative would place 11.5 miles of the transmission line underneath roadways with only 2.8 miles overhead. The portion of the alignment west of I-15 would be located in an industrial area with limited conflicts with existing land use. This alternative would reduce most overhead impacts in all the residential areas adjacent to the Proposed Project corridor including visual impacts, health and safety concerns, and construction effects.
- **Noise.** This alternative would reduce corona noise impacts to residences along the overhead portions of the proposed route.
- **Recreation.** This alternative would avoid conflicts with constructing a cable pole in Black Mountain Ranch Community Park.

Environmental Disadvantages
This alternative has the following potential disadvantages:

- **Air Quality and Greenhouse Gases.** Construction of an underground transmission line would result in more intense vehicle activity; therefore, this alternative would result in greater impacts to air quality and would generate more greenhouse gas emissions than the Proposed Project.
- **Utilities.** Because this alternative would replace most of the Proposed Project with an underground transmission line parallel to other utilities, the transmission line could result in impacts to other utilities if not properly designed or constructed and could result in greater AC induced currents on parallel buried utility pipelines.

- **Hazardous Materials.** The Pomerado Road to Miramar Area North Alternative would be constructed in areas of known environmental contamination from leaking underground fuel tanks and in areas of potential contamination resulting from commercial, light industrial, and manufacturing activities. Underground construction would potentially cause exposure to the contamination.
- **Traffic.** The increased underground construction within area roadways and construction in roadways with high traffic volumes could increase traffic impacts relative to the Proposed Project.
- **Cultural Resources.** The increased underground construction would have a greater potential to encounter buried cultural resources or human remains.

4.3.3.3 Conclusions

RETAINED FOR ANALYSIS. This alternative would meet project objectives and is potentially feasible. It has been retained because it would offer substantial avoidance of environmental effects to residents near the Proposed Project and avoid impacts within Black Mountain Ranch, Del Mar Mesa, and Los Peñasquitos Canyon Preserves. This alternative has therefore been retained for full analysis in the EIR.

4.4 CABLE POLE ALTERNATIVES ELIMINATED

The cable pole relocation alternatives that were eliminated are shown on Figure 4.4-1.

4.4.1 Alternative 1a: Eastern Cable Pole Option 1 (SDG&E Application)

4.4.1.1 Description

Eastern Cable Pole Option 1a is a design option to Alternative 1b: Eastern Cable Pole Option 1b. Alternative 1a would use three separate steel tubular cable poles, one for each of the three phases of the new 230-kV transmission line. Two of the three poles would be approximately 55 feet tall. The third pole (which would be located furthest east) would be approximately 85 feet tall and would support the third phase of circuit as well as the optical ground wire. Eastern Cable Pole Option 1a would require a slightly shorter underground segment compared to the Proposed Project (about 500 feet less), and would not require an underground splice vault within the driveway to Black Mountain Ranch Community Park.

4.4.1.2 Consideration of CEQA Criteria

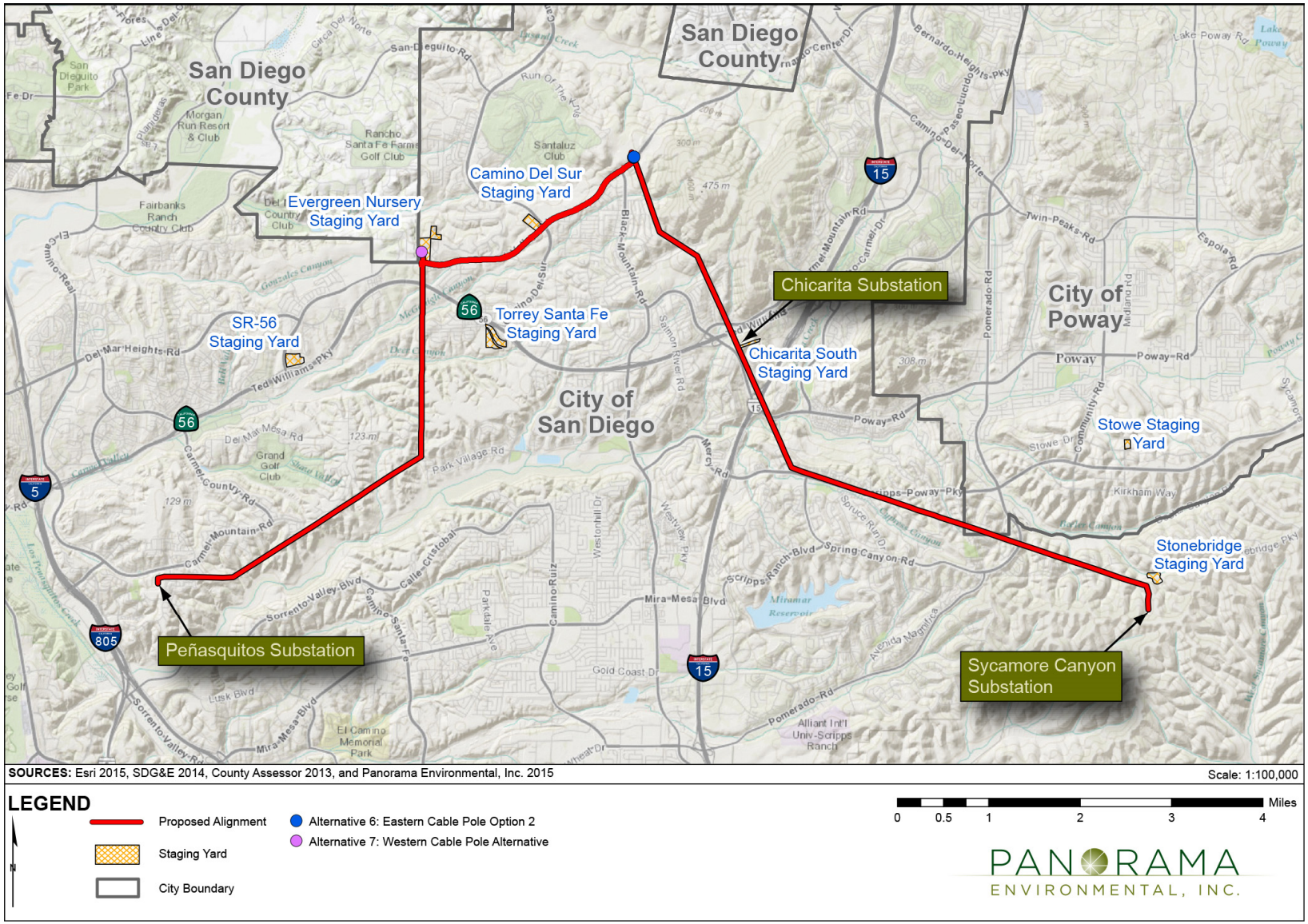
Project Objectives

Eastern Cable Pole Option 1a would meet all project objectives because it would allow for construction of a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations, comparable to the Proposed Project.

Technical, Legal, and Regulatory Feasibility

This alternative would potentially meet technical, legal, and regulatory feasibility criteria. The three cable poles could be constructed on the south side of Carmel Valley Road and within SDG&E ROW.

Figure 4.4-1 Cable Pole Alternatives Eliminated



Environmental Feasibility

Environmental Advantages

The advantages of this alternative are associated with relocating the cable pole outside of Black Mountain Ranch Community Park. Potential environmental advantages include:

- **Recreation and Land Use.** Black Mountain Ranch Community Park is an existing sports facility that supports mainly baseball and soccer activities. Unlike the Proposed Project, Eastern Cable Pole Option 1a would locate cable pole P41 outside the boundaries of Black Mountain Ranch Community Park and would therefore reduce significant and unavoidable impacts on recreational activities and access during construction.
- **Aesthetics.** The tallest of the three structures in Eastern Cable Pole Option 1a would be approximately 75 feet shorter than the Proposed Project (85 feet tall compared to the Proposed Project 160 foot-tall cable pole), and would reduce significant unavoidable visual impacts within Black Mountain Ranch Community Park and the immediately adjacent open space trails.
- **Traffic and Transportation**. Eastern Cable Pole Option 1a would not require an underground splice vault within Black Mountain Ranch Community Park, and would therefore not result in significant park access or parking impacts.

Environmental Disadvantages

Potential environmental disadvantages include:

- **Aesthetics.** The cable poles consist of a bulky three-pole structure and surrounding fence that would affect views on Carmel Valley Road. This would affect a different viewer group than the Proposed Project cable pole in Black Mountain Ranch Community Park and the bulky three-pole structure would have greater aesthetic impacts than Alternative 1b, described above.
- **Transportation and Traffic.** The alternative could increase traffic hazards due to the proximity of the cable pole and surrounding fence to Carmel Valley Road.

4.4.1.3 Conclusion

ELIMINATED. Eastern Cable Pole Option 1a meets the project objectives and potentially meets all feasibility criteria. The alternative would reduce significant and unavoidable impacts to recreation, land use, aesthetics, and traffic and transportation in Black Mountain Ranch Community Park; however, the alternative would result in substantially greater aesthetic impacts at Carmel Valley Road due to the large size of the three-cable-pole structure. This alternative was therefore modified to Alternative 1b, a single cable pole at Carmel Valley Road, as opposed to a three-pole structure. The alternative option 1b, a single cable pole at Carmel Valley Road has been retained for analysis in the EIR, and this alternative option has been eliminated from further analysis.

4.4.2 Alternative 6: Eastern Cable Pole Option 2 (SDG&E Application)

4.4.2.1 Description

Eastern Cable Pole Option 2 would locate cable pole P41 within Black Mountain Ranch Community Park at the location proposed by SDG&E in their PEA. The alternative cable pole would be located along the eastern margin of the southeast ball field and in the middle of the park. The underground transmission line would extend from the cable pole through the entrance to Black Mountain Ranch Community Park to Carmel Valley Road.

4.4.2.2 Consideration of CEQA Criteria

Project Objectives

This alternative meets all project objectives. Eastern Cable Pole Option 2 would allow for construction of a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations, comparable to the Proposed Project.

Technical, Legal, and Regulatory Feasibility

This alternative is located within SDG&E ROW near an existing transmission tower. The alternative is potentially feasible and meets technical, legal, and regulatory feasibility criteria, but would be difficult to construct within the middle of a City park.

Environmental Feasibility

Environmental Advantages

The cable pole location within the park would avoid temporary and permanent impacts to the City MSCP Preserve and sensitive biological habitats within the preserve north of Black Mountain Ranch Community Park.

Environmental Disadvantages

The alternative would result in substantially greater impacts to recreation and aesthetics than the Proposed Project by locating the cable pole at the center of the park and resulting in the loss of recreational area within a baseball field and greater visibility of the pole due to its location a recreational field rather than along the margin of the park.

4.4.2.3 Conclusions

ELIMINATED. Eastern Cable Pole Option 2 was eliminated from analysis because it would result in substantially greater impacts to aesthetics and recreational resources. While the alternative would reduce impacts to the MSCP Preserve north of Black Mountain Ranch Community Park, the substantial increase in the severity of recreation and aesthetic impacts at the park would outweigh the benefits of avoiding impacts to open space areas. In addition, Alternatives 1b, 2a, and 2b avoid impacts to the open space areas north of the park without increasing the impacts to recreational uses at Black Mountain Ranch Community Park.

4.4.3 Alternative 7: Western Cable Pole Alternative (SDG&E Application)

4.4.3.1 Description

The Western Cable Pole Alternative is an alternate option for Proposed Project cable pole P42—the cable pole that would be used to transfer the transmission line from overhead to

underground at the western end of Segment B. Instead of using a double-circuit monopole structure about 100 feet south of Carmel Valley Road within existing SDG&E ROW as proposed, the Western Cable Pole Alternative would use a double-circuit monopole structure about 200 feet north of Carmel Valley Road within the Evergreen Nursery property.

The Proposed Project would replace existing structure R48, which is a double-circuit steel lattice tower approximately 127 feet in height that currently supports TL 23001 and TL 23004. The Western Cable Pole Alternative would not directly replace any existing structures but instead adds another structure in this area. The Proposed Project's cable pole would be approximately 165 feet tall and would support TL 23004. The Western Cable Pole Alternative option would use a 145-foot-tall tubular steel double-circuit monopole structure.

4.4.3.2 Consideration of CEQA Criteria

Project Objectives
The Western Cable Pole Alternative would meet project objectives because it would allow for construction of a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations, comparable to the Proposed Project.

Technical, Legal, and Regulatory Feasibility
This alternative is potentially feasible and meets technical, legal, and regulatory feasibility criteria. The alternative would locate the cable pole in an existing SDG&E easement and would meet regulatory and legal criteria.

Environmental Feasibility
Environmental Advantages
The western cable pole is very similar to the Proposed Project; therefore, the environmental impacts of the Proposed Project and the Western Cable Pole Alternative would be similar. The Western Cable Pole Alternative would not have any considerable environmental advantages compared to the Proposed Project.

Environmental Disadvantages
This alternative would result in a new structure within the ROW; unlike the Proposed Project, it would not involve replacing or removing existing structure R48, a 127-foot-tall double-circuit steel lattice tower. The alternative would also require construction and operation of a new cable pole within Evergreen Nursery, which may expose workers and customers at the nursery to greater hazards than the Proposed Project.

4.4.3.3 Conclusions

ELIMINATED. The alternative was eliminated from full analysis in the EIR because it would not reduce any significant environmental impacts of the Proposed Project.

4.5 POLE RELOCATION ALTERNATIVES ELIMINATED

The pole relocation alternatives that were eliminated are shown on Figure 4.5-1.

4.5.1 Alternative 8: Segment A Pole Relocations (CPUC)

4.5.1.1 Description

The Segment A Pole Relocation Alternative involves relocation of proposed poles P5, P17 through P21, P24, and P34 within Segment A:

- P5 would be shifted from its existing location in the Proposed Project, towards the existing H-frame location and in-line with the Proposed Project's alignment.
- Poles P17 through P21 would be shifted from the existing locations in the Proposed Project, 30 feet away from residences, and out-of-line of the Proposed Project's transmission alignment, but within the SDG&E ROW.
- Pole P24 would be shifted southeast, in line with the Proposed Project's alignment. P24 would be located in a less sloped area and would be 20 feet higher than P24 for the Proposed Project.
- P34 would be shifted in-line with the Proposed Project's alignment. P34 would be located adjacent to an existing monopole.

4.5.1.2 Consideration of CEQA Criteria

Project Objectives

This alternative would meet project objectives because it would allow for construction of a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations, comparable to the Proposed Project.

Technical, Legal, and Regulatory Feasibility

This alternative is potentially feasible and meets technical, legal, and regulatory feasibility criteria. The alternative can be constructed within SDG&E ROW and would not require any new ROW or easements.

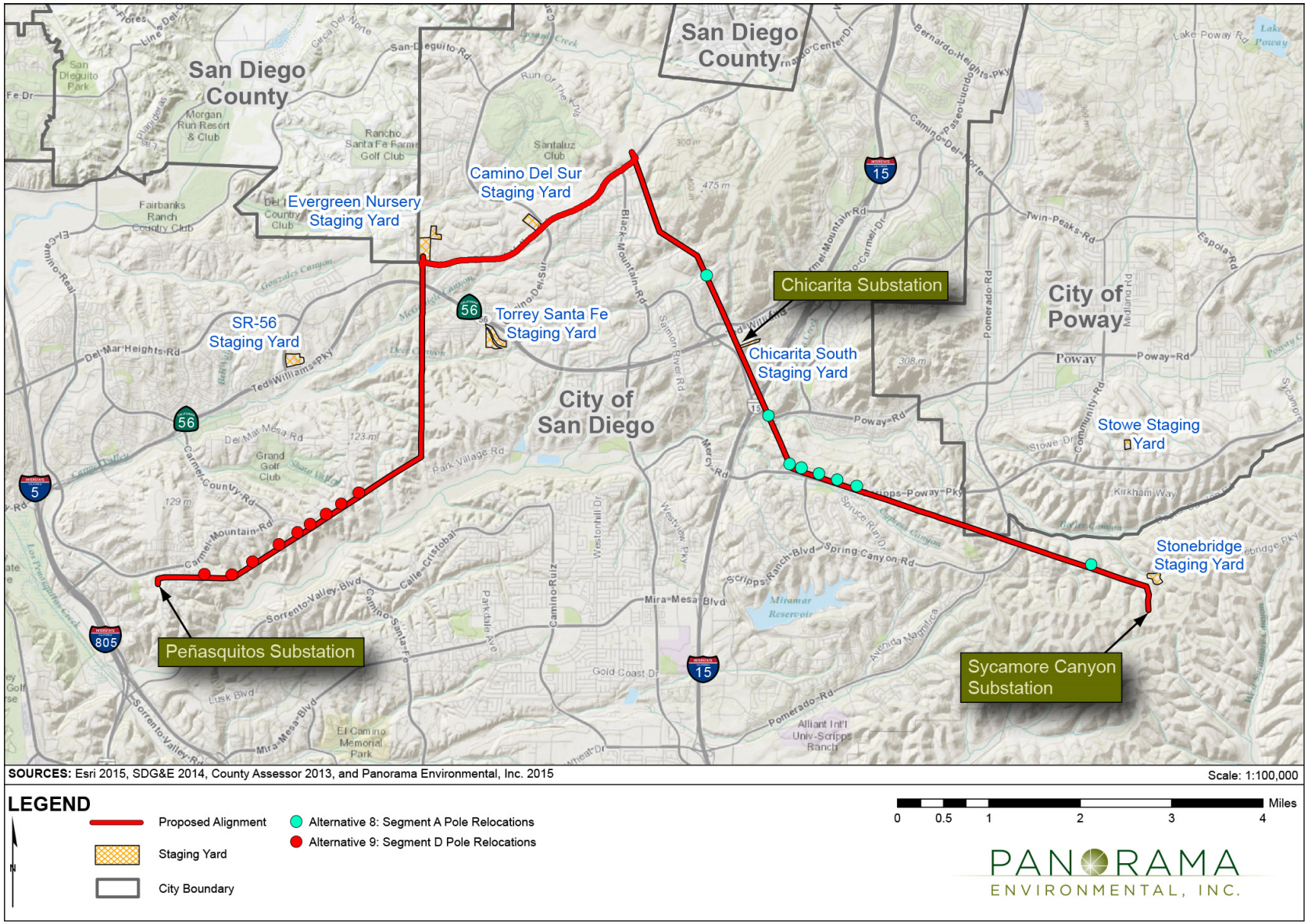
Environmental Feasibility

Environmental Advantages

The potential advantages of this alternative are associated with locating poles further from residences. Potential environmental advantages include:

- **Aesthetics.** Impacts to visual resources could be slightly reduced by the movement of the poles further from residences; however, use of a 20 foot taller pole for P24 would be required which could result in greater aesthetic impacts.
- **Noise.** Corona noise impacts could be slightly reduced because the transmission poles would be located 20 to 30 feet further from the nearest residences.

Figure 4.5-1 Pole Relocations Eliminated



Environmental Disadvantages
The potential environmental issues associated with shifting P17 through P21 outside of the Proposed Project alignment but within the SDG&E ROW include:

- **Biological Resources.** Construction of P17, P20, and P21 would require the construction of temporary poles (shoo fly), which would result in increased work areas, additional temporary impacts, and additional grading relative to the Proposed Project. This alternative would have additional impacts to biological resources due to increased impacts to vegetation communities from construction and increased indirect impacts from additional erosion and noise.
- **Hydrology and Water Resources.** Construction of P18 would result in a temporary impact to an existing concrete drainage swale along the road side as a result of construction vehicle access during pole construction.
- **Noise and Air Quality.** Construction of P17, P20, and P21 would require additional crews, additional work days, increased equipment use, and increased truck/vehicle trips. These increased construction requirements could potentially increase air/GHGs emissions and noise generation during construction.
- **Utilities.** The movement of P17 through P21 outside of the project alignment could result in potential conflicts with existing overhead communication lines/power lines due to overhead clearances for drill rig and rebar cages required for construction. This alternative could potentially result in additional outages during construction, compared to the Proposed Project due to potential for these utility conflicts.

4.5.1.3 Conclusions
ELIMINATED. The Segment A Pole Relocation Alternative is rejected from further analysis because it would not measurably reduce any significant impact of the Proposed Project and could generate additional environmental impacts. This alternative has therefore been eliminated from full analysis in the EIR.

4.5.2 Alternative 9: Segment D Pole Relocations South of Existing Line (Scoping; CPUC)

4.5.2.1 Description
Under this alternative, poles P48 through P57 would be relocated 30 to 40 feet south within Los Peñasquitos Canyon and away from residences. The relocated poles would be located within the existing SDG&E ROW.

4.5.2.2 Consideration of CEQA Criteria

Project Objectives
This alternative would meet project objectives because it would allow for construction of a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations, comparable to the Proposed Project.

Technical, Legal, and Regulatory Feasibility
This alternative is potentially feasible and meets technical, legal, and regulatory feasibility criteria. The alternative can be constructed within SDG&E ROW and would not require any new ROW or easements.

Environmental Feasibility
Environmental Advantages
The potential advantages of this alternative are associated with locating poles further from residences. Potential environmental advantages include:

- **Aesthetics.** Impacts to visual resources would be reduced by the movement of the poles away from residents; however, use of taller poles would be required which could result in greater aesthetic impacts.
- **Noise.** Because the transmission poles are located further away from residents, noise impacts would be reduced.

Environmental Disadvantages
The potential environmental disadvantages for this alternative include:

- **Biological Resources.** This alternative would result in more potential impacts to vegetation communities than the Proposed Project, which could potentially have an impact on biological resources. Vegetation community impacts would result from either the extension of an access road, refurbishing an existing access road, and from the additional use of retaining walls.
- **Geology and Soils, and Hydrology and Water Resources.** This alternative would have a greater potential for erosion due to construction in steeply sloping terrain, and therefore, could cause greater erosion and water quality impacts than the Proposed Project.
- **Land Use.** It is anticipated that this alternative would have greater ground disturbance impacts within the California Coastal Zone due to extension of access roads further into Los Peñasquitos Canyon Preserve, which is within the City of San Diego's Coastal Zone. In addition, the alternative would be subject to more grading than the Proposed Project due to construction on steeper terrain.
- **Noise and Air Quality.** Construction would require additional crews, additional work days, increased equipment use, and increased truck/vehicle trips. These increased construction requirements could potentially increase air/GHG emissions and noise.

4.5.2.3 Conclusions
ELIMINATED. The Segment D Pole Relocation South of Existing Line Alternative is rejected from further analysis. While this alternative could marginally reduce aesthetics and noise impacts, it would increase the severity of biological resources, geology, land use, and air quality impacts.

4.6 TRANSMISSION LINE ROUTING ALTERNATIVES ELIMINATED

Transmission route alternatives that were eliminated are shown on Figure 4.6-1 through 4.6-2.

4.6.1 Alternative 10: Northern Alignment Number 1 (SDG&E Application/PEA)

4.6.1.1 Description

Alternative 10 is 27.66 miles long, extends further north than the Proposed Project alignment, and would essentially replace the Proposed Project Segment B (undergrounding in Carmel Valley Road) with an alternate overhead alignment located north of Carmel Valley Road.

Alternative 10 would use existing SDG&E ROW from the Sycamore Canyon Substation north for approximately 15.3 miles (including the entire 8.3 miles of Segment A of the Proposed Project). The route then travels approximately 0.3 mile west. Northern Alignment Alternative Number 1 would continue south approximately 8.9 miles utilizing existing structures (including 2.1 miles of Segment C of the Proposed Project) until reaching the Peñasquitos Junction. The alternative would use Segment D as proposed.

Alternative 10 would be approximately 10.9 miles longer than the proposed route. This route would be installed overhead, and would eliminate the 2.84-mile-long underground Segment B. The overall length of the transmission line would increase by approximately 66 percent and length installed overhead would double.

4.6.1.2 Consideration of CEQA Criteria

Project Objectives

Alternative 10 meets project objectives by constructing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations, comparable to the Proposed Project.

Technical, Legal, and Regulatory Feasibility

This alternative has the potential for technical, legal, and regulatory feasibility.

Environmental Feasibility

Environmental Advantages

Alternative 10 would not include the proposed underground transmission line within public roadways, and would therefore reduce the following environmental impact of the Proposed Project:

- **Traffic.** Construction of an overhead line would avoid temporary lane and road closures associated with trenching and installation of vault structures on Carmel Valley Road.

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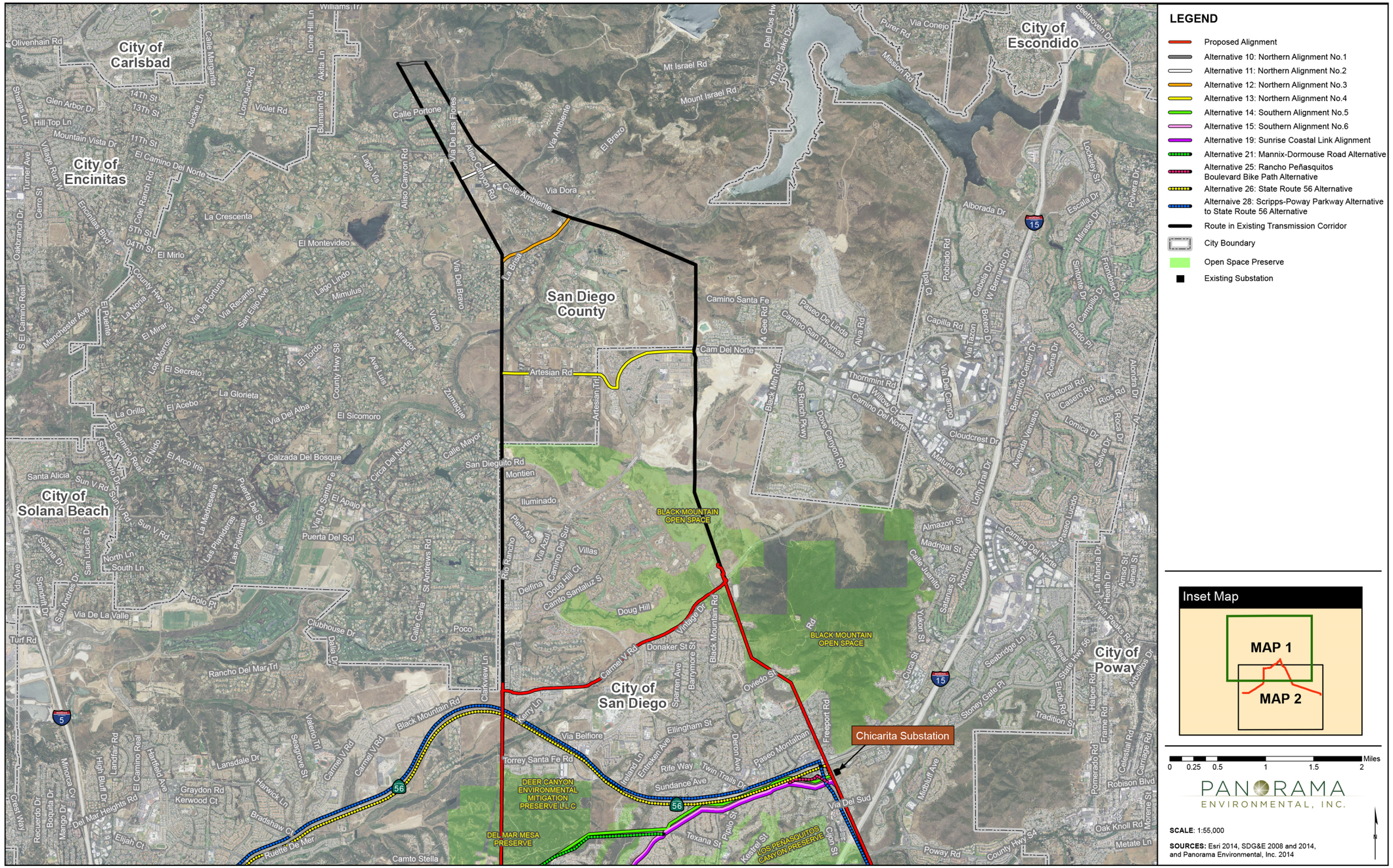
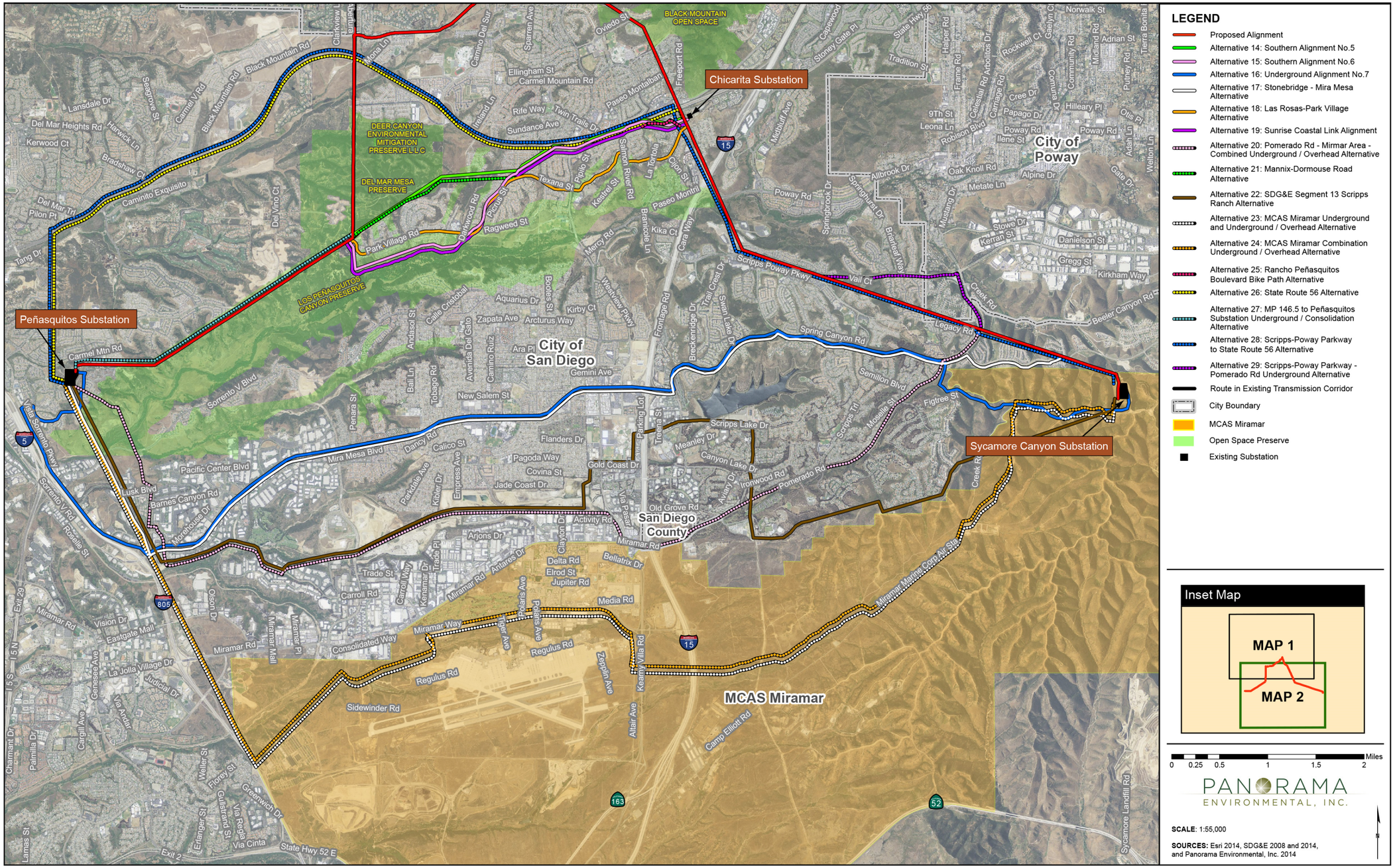
Figure 4.6-1 Transmission Line Route Alternatives Eliminated from Further Analysis (North)



LEGEND

- Proposed Alignment
- Alternative 10: Northern Alignment No.1
- Alternative 11: Northern Alignment No.2
- Alternative 12: Northern Alignment No.3
- Alternative 13: Northern Alignment No.4
- Alternative 14: Southern Alignment No.5
- Alternative 15: Southern Alignment No.6
- Alternative 19: Sunrise Coastal Link Alignment
- Alternative 21: Mannix-Dormouse Road Alternative
- Alternative 25: Rancho Peñasquitos Boulevard Bike Path Alternative
- Alternative 26: State Route 56 Alternative
- Alternaive 28: Scripps-Poway Parkway Alternative to State Route 56 Alternative
- Route in Existing Transmission Corridor
- City Boundary
- Open Space Preserve
- Existing Substation

Figure 4.6-2 Transmission Line Route Alternatives Eliminated from Further Analysis (South)



LEGEND

- Proposed Alignment
- Alternative 14: Southern Alignment No.5
- Alternative 15: Southern Alignment No.6
- Alternative 16: Underground Alignment No.7
- Alternative 17: Stonebridge - Mira Mesa Alternative
- Alternative 18: Las Rosas-Park Village Alternative
- Alternative 19: Sunrise Coastal Link Alignment
- Alternative 20: Pomerado Rd - Mirmar Area - Combined Underground / Overhead Alternative
- Alternative 21: Mannix-Dormouse Road Alternative
- Alternative 22: SDG&E Segment 13 Scripps Ranch Alternative
- Alternative 23: MCAS Miramar Underground and Underground / Overhead Alternative
- Alternative 24: MCAS Miramar Combination Underground / Overhead Alternative
- Alternative 25: Rancho Peñasquitos Boulevard Bike Path Alternative
- Alternative 26: State Route 56 Alternative
- Alternative 27: MP 146.5 to Peñasquitos Substation Underground / Consolidation Alternative
- Alternative 28: Scripps-Poway Parkway to State Route 56 Alternative
- Alternative 29: Scripps-Poway Parkway - Pomerado Rd Underground Alternative
- Route in Existing Transmission Corridor
- City Boundary
- MCAS Miramar
- Open Space Preserve
- Existing Substation

Environmental Disadvantages

The potential environmental disadvantages for this alternative include:

- **Aesthetics.** This alternative would result in greater visual impacts than the Proposed Project due to an increase in overhead transmission line length and number of affected viewers, and decrease in transmission line length installed underground.
- **Biological Resources.** Northern Alignment Alternative Number 1 would require additional temporary and permanent impact areas, including temporary structure work areas, permanent structure maintenance pads, and temporary stringing sites. These increased impact areas would result in greater impacts to biological resources compared to the Proposed Project. Impacts to sensitive vegetation communities would increase proportionately with the length of the proposed route. The longer the alignment, the greater the number of structures and stringing sites, which could result in greater impacts to sensitive vegetation communities. The potential for impacts to sensitive plant and wildlife species increases with the increased length of each alternative alignment. The greater the footprint of a given alternative alignment, the greater potential for adverse effects to sensitive plant and wildlife species.
- **Cultural Resources.** Northern Alignment Alternative Number 1 would result in larger impact areas when compared to the Proposed Project. Therefore, the potential for impacts to cultural, historical, and paleontological resources would increase in general proportion to the increase in impact area.
- **Noise.** Construction noise impacts would increase (in extent) proportional to the increase in alignment length as exposure of noise sensitive areas would increase with the length of the alignment. While noise impacts would increase for the longer alignment alternative, it is not anticipated to change the severity (relative significance) of these effects because the same types of vehicles and equipment would be used to construct the alternative.
- **Air Quality and Greenhouse Gas Emissions.** Construction air and greenhouse gas emissions would increase proportional to any increase in the usage of construction equipment. The longer alignment alternative would require a higher total of construction equipment (greater total construction equipment hours required to construct additional structure installation/removal and conductor stringing), which would result in greater overall emissions of criteria pollutants and greenhouse gases. In addition, the increased air quality impacts could result in more severe (i.e., more significant) effects as any increase in the amount of equipment operating simultaneously would increase the maximum daily emissions of criteria pollutants, thereby increasing the severity of the effects under CEQA.
- **Recreation.** The potential for temporary impacts to parks, trails, and other recreational facilities would increase (in extent) proportional to the increase in alignment length as the number of recreational and public facilities affected can only increase as the length of the alignment increases. The increased impacts to

public and recreational facilities would very likely increase in extent (i.e., number of impacted facilities), but would not likely result in increased severity of impacts.

4.6.1.3 Conclusions

ELIMINATED. Alternative 10 was rejected from further analysis. While Northern Alignment Number 1 would reduce significant traffic impacts from construction of the underground route, it would have longer and/or more intensive construction schedule resulting in greater and more significant environmental impacts compared to the Proposed Project. This alternative could result in more severe operational impacts because the additional miles of overhead transmission line would have greater aesthetic impacts than the Proposed Project.

4.6.2 Alternative 11: Northern Alignment Number 2 (SDG&E Application/PEA)

4.6.2.1 Description

Alternative 11 is 25.09 miles long, extends further north than the Proposed Project alignment, and would essentially replace the Proposed Project Segment B (undergrounding in Carmel Valley Road) with an alternative overhead alignment located north of Carmel Valley Road. Northern Alignment Alternative Number 2 would utilize much of the alignment included as part of the Proposed Project.

Alternative 11 would use existing SDG&E ROW from the Sycamore Canyon Substation north for approximately 14 miles (including 8.3 miles of Segment A of the Proposed Project). The route then travels approximately 0.4 mile west. Alternative 11 would then continue south approximately 7.5 miles utilizing existing structures (including 2.1 miles of Segment C of the Proposed Project) until reaching the Peñasquitos Junction. Alternative 11 would utilize Segment D as included within the Proposed Project.

Alternative 11 would be approximately 8.39 miles longer than the proposed route. This route would be installed aboveground, and would eliminate the 2.84-mile-long underground Segment B. The overall length of the transmission line would increase by approximately 50 percent and the length installed aboveground would increase by 81 percent.

4.6.2.2 Consideration of CEQA Criteria

Project Objectives

Alternative 11meets project objectives by constructing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations, comparable to the Proposed Project.

Technical, Legal, and Regulatory Feasibility

This alternative has the potential for technical, legal, and regulatory feasibility.

Environmental Feasibility

Environmental Advantages

Alternative 11 would not include the underground transmission line within public roadways, and would therefore reduce the following environmental impact of the Proposed Project:

- **Traffic.** Construction of an overhead line would avoid temporary lane and road closures associated with trenching and installation of vault structures on Carmel Valley Road.

Environmental Disadvantages

The potential environmental disadvantages for this alternative include:

- **Aesthetics.** This alternative would result in greater visual impacts than the Proposed Project due to an increase in overhead transmission line length and number of affected viewers. Alternative 11 would also involve the addition of 0.39 miles of new ROW, which would permanently impact the existing visual setting in that area.
- **Biological Resources.** Alternative 11 would require additional temporary and permanent impact areas, including temporary structure work areas, permanent structure maintenance pads, and temporary stringing sites. These increased impact areas would result in greater impacts to biological resources compared to the Proposed Project. Impacts to sensitive vegetation communities would increase proportionately with the length of the proposed route. The longer the alignment, the greater the number of structures and stringing sites, which could result in greater impacts to sensitive vegetation communities. The potential for impacts to sensitive plant and wildlife species increases with the increased length of each alternative alignment. The greater the footprint of a given alternative alignment, the greater potential for adverse effects to sensitive plant and wildlife species.
- **Cultural Resources.** Alternative 11 would result in larger impact areas when compared to the Proposed Project. Therefore, the potential for impacts to cultural, historical, and paleontological resources would increase in general proportion to the increase in impact area.
- **Noise.** Construction noise impacts would increase (in extent) proportional to the increase in alignment length as exposure of noise sensitive areas would increase with the length of the alignment. While noise impacts would increase for the longer alignment alternative, it is not anticipated to change the severity (relative significance) of these effects because the same type of vehicles and equipment would be required to construct the alternative.
- **Air Quality and Greenhouse Gas Emissions.** Construction air and greenhouse gas emissions would increase proportional to any increase in the usage of construction equipment. The longer alignment alternative would require additional construction equipment (greater total construction equipment hours required to construct additional structure installation/removal and conductor stringing), which would result in greater overall emissions of criteria pollutants and greenhouse gases. In addition, the increased air quality impacts could result in more severe (i.e., more significant) effects as any increase in the amount of equipment operating simultaneously would increase the maximum daily emissions of criteria pollutants, thereby increasing the severity of the effects under CEQA.

- **Recreation.** The potential for temporary impacts to parks, trails, and other recreational facilities would increase (in extent) proportional to the increase in alignment length as the number of recreational and public facilities affected can only increase as the length of the alignment increases. The increased impacts to public and recreational facilities would very likely increase in extent (i.e., number of impacted facilities) but would not likely result in increased severity of impacts.

4.6.2.3 Conclusions

ELIMINATED. Alternative 11 was rejected from further analysis. While Alternative 11 would reduce significant traffic impacts from construction of the underground route, it would have longer and/or more intensive construction schedules resulting in greater and potentially more significant environmental impacts compared to the Proposed Project. This alternative could result in more severe operational impacts because the additional miles of overhead transmission line would have greater aesthetic impacts than the Proposed Project.

4.6.3 Alternative 12: Northern Alignment Number 3 (SDG&E Application/PEA)

4.6.3.1 Description

Alternative 12 is 23.62 miles long, extends further north than the Proposed Project alignment, and would essentially replace the Proposed Project Segment B (undergrounding in Carmel Valley Road) with an alternative alignment (overhead and some limited underground) located north of Carmel Valley Road. Alternative 12 would utilize much of the alignment included as part of the Proposed Project.

Alternative 12 would use existing SDG&E ROW from the Sycamore Canyon Substation north for approximately 13 miles (including 8.3 miles of Segment A of the Proposed Project). The route then travels approximately 0.9 mile west within a franchise position in Del Dios Highway until connecting with existing SDG&E ROW. This segment of Northern Alignment Alternative Number 3 would include new construction of underground single-circuit 230-kV transmission line. Northern Alignment Alternative Number 3 would then continue south approximately 6.5 miles utilizing existing structures (including 2.1 miles of Segment C of the Proposed Project) until reaching the Peñasquitos Junction. Northern Alignment Alternative Number 3 would utilize Segment D as included within the Proposed Project.

Alternative 12 would be approximately 6.92 miles longer than the proposed route. This route would reduce the length of transmission line installed underground by approximately 1.98 miles, and increase the length installed aboveground by 8.9 miles. The overall length of the transmission line would increase by approximately 41 percent, underground line length would be reduced by approximately 70 percent, and aboveground length would increase by 64 percent compared to the Proposed Project.

4.6.3.2 Consideration of CEQA Criteria

Project Objectives

Alternative 12 meets project objectives by constructing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations, comparable to the Proposed Project.

Technical, Legal, and Regulatory Feasibility
This alternative potentially meets criteria for technical, legal, and regulatory feasibility.

Environmental Feasibility
Environmental Advantages
Alternative 12 would involve less underground transmission and would therefore reduce impacts on traffic and transportation in Segment B of the Proposed Project.

Environmental Disadvantages
The potential environmental disadvantages for this alternative include:

- **Aesthetics.** This alternative would result in greater visual impacts than the Proposed Project due to an increase in overhead transmission line length and number of affected viewers.
- **Biological Resources.** Northern Alignment Alternative Number 3 would require additional temporary and permanent impact areas, including temporary structure work areas, permanent structure maintenance pads, and temporary stringing sites. These increased impact areas would result in greater impacts to biological resources compared to the Proposed Project. Impacts to sensitive vegetation communities would increase proportionately with the length of proposed route. The longer the alignment, the greater the number of structures and stringing sites, which could result in greater impacts to sensitive vegetation communities. The potential for impacts to sensitive plant and wildlife species increases with the increased length of each alternative alignment. The greater the footprint of a given alternative alignment, the greater potential for adverse effects to sensitive plant and wildlife species.
- **Cultural Resources.** Northern Alignment Alternative Number 3 would result in larger impact areas when compared to the Proposed Project. Therefore, the potential for impacts to cultural, historical, and paleontological resources would increase in general proportion to the increase in impact area.
- **Noise.** Construction noise impacts would increase (in extent) proportional to the increase in alignment length as exposure of noise sensitive areas would increase with the length of the alignment. While noise impacts would increase for the longer alignment alternative, it is not anticipated to change the severity (relative significance) of these effects because the same type of equipment would be required to construct the alternative.
- **Air Quality and Greenhouse Gas Emissions.** Construction air and greenhouse gas emissions would increase proportional to any increase in the usage of construction equipment. The longer alignment alternative would require a higher total of construction equipment (greater total construction equipment hours required to construct additional structure installation/removal and conductor stringing), which would result in greater overall emissions of criteria pollutants and greenhouse gases. In addition, the increased air quality impacts could result in more severe (i.e., more significant) effects as any increase in the amount of equipment operating

simultaneously would increase the maximum daily emissions of criteria pollutants, thereby increasing the severity of the effects under CEQA.

- **Recreation.** The potential for temporary impacts to parks, trails, and other recreational facilities would increase in extent proportional to the increase in alignment length as the number of recreational and public facilities affected can only increase as the length of the alignment increases. The increased impacts to public and recreational facilities would very likely increase in extent (i.e., number of impacted facilities), but would not likely result in increased severity of impacts.

4.6.3.3 Conclusions

ELIMINATED. Alternative 12 was rejected from further analysis. Alternative 12 would reduce significant traffic impacts from construction of the underground route, and have longer and/or more intensive construction schedules resulting in greater and potentially more significant environmental impacts compared to the Proposed Project. This alternative could result in more severe operational impacts because the additional miles of overhead transmission line would have greater aesthetic impacts than the Proposed Project.

4.6.4 Alternative 13: Northern Alignment Number 4 (SDG&E Application/PEA)

4.6.4.1 Description

Alternative 13 is 21.6 miles long, extends further north than the proposed project alignment, and would essentially replace the Proposed Project Segment B (undergrounding in Carmel Valley Road) with an alternative alignment (overhead and some limited underground) located north of Carmel Valley Road. Alternative 13 would utilize much of the alignment included as part of the Proposed Project.

Alternative 13 would use existing SDG&E ROW from the Sycamore Canyon Substation north for approximately 10.7 miles (including 8.3 miles of Segment A of the Proposed Project). The route then travels approximately 2.26 miles west within a franchise position in Del Dios Highway until connecting with existing SDG&E ROW. This segment of Alternative 13 would include new construction of underground single-circuit 230-kV transmission line. Alternative 13 would then continue south approximately 5.4 miles utilizing existing structures (including 2.1 miles of Segment C of the Proposed Project) until reaching the Peñasquitos Junction. Alternative 13 would utilize Segment D as included within the proposed route.

Alternative 13 would be approximately 4.9 miles longer than the proposed route. This route would also reduce the length of transmission line installed underground by approximately 0.58 mile, and increase the length installed overhead by 5.48 miles. The overall length of the transmission line would increase by approximately 29 percent, underground line length would be reduced by approximately 20 percent, and overhead length would increase by 40 percent compared to the Proposed Project.

4.6.4.2 Consideration of CEQA Criteria

Project Objectives
Alternative 13 meets all of the project objectives by constructing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations.

Technical, Legal, and Regulatory Feasibility
This alternative has the potential for technical, legal, and regulatory feasibility.

Environmental Feasibility
Environmental Advantages
Alternative 13 would involve less underground transmission and would therefore reduce impacts on traffic and transportation in Segment B. There are no other environmental advantages to this alternative.

Environmental Disadvantages
The potential environmental disadvantages for this alternative include:

- **Aesthetics.** This alternative would result in greater visual impacts than the Proposed Project due to an increase in overhead transmission line length and number of affected viewers, and decrease in transmission line length installed underground.
- **Biological Resources.** Alternative 13 would require additional temporary and permanent impact areas, including temporary structure work areas, permanent structure maintenance pads, and temporary stringing sites. These increased impact areas would result in greater impacts to biological resources compared to the Proposed Project. Impacts to sensitive vegetation communities would increase proportionately with the length of proposed route. The longer the alignment, the greater the number of structures and stringing sites, which could result in greater impacts to sensitive vegetation communities. The potential for impacts to sensitive plant and wildlife species increases with the increased length of each alternative alignment. The greater the footprint of a given alternative alignment, the greater potential for adverse effects to sensitive plant and wildlife species.
- **Cultural Resources.** Alternative 13 would result in larger impact areas when compared to the Proposed Project. Therefore, the potential for impacts to cultural, historical, and paleontological resources would increase in general proportion to the increase in impact area.
- **Noise.** Construction noise impacts would increase in extent proportional to the increase in alignment length as exposure of noise sensitive areas would increase with the length of the alignment. While noise impacts would increase for the longer alignment alternative, it is not anticipated to change the severity (relative significance) of these effects because the same type of equipment would be required to construct the alternative.
- **Air Quality and Greenhouse Gas Emissions.** Construction air and greenhouse gas emissions would increase proportional to any increase in the usage of construction

equipment. The longer alignment alternative would require additional construction equipment (greater total construction equipment hours required to construct additional structure installation/removal and conductor stringing), which would result in greater overall emissions of criteria pollutants and greenhouse gases. In addition, the increased air quality impacts could result in more severe (i.e., more significant) effects as any increase in the amount of equipment operating simultaneously would increase the maximum daily emissions of criteria pollutants, thereby increasing the severity of the effects under CEQA.

- **Recreation.** The potential for temporary impacts to parks, trails, and other recreational facilities would increase in extent proportional to the increase in alignment length as the number of recreational and public facilities affected can only increase as the length of the alignment increases. The increased impacts to public and recreational facilities would very likely increase in extent (i.e., number of impacted facilities) but would not likely result in increased severity of impacts.

4.6.4.3 Conclusions

ELIMINATED. Alternative 13 was rejected from further analysis. While Alternative 13 would reduce significant traffic impacts from construction of the underground route, it would have longer and/or more intensive construction schedules resulting in greater and potentially more significant environmental impacts compared to the Proposed Project. This alternative could result in more severe operational impacts because the additional miles of overhead transmission line would have greater aesthetic impacts than the Proposed Project.

4.6.5 Alternative 14: Southern Alignment Number 5 (SDG&E Application/PEA)

4.6.5.1 Description

Alternative 14 is 12.8 miles long, would not extend further north than the existing Chicarita Substation located south of SR-56, and would essentially replace the Proposed Project Segment B (undergrounding in Carmel Valley Road) and Segment C with an alternative overhead alignment located south of SR-56. Southern Alignment Number 5 would utilize approximately half of the alignment included as part of the Proposed Project, including about two thirds of Segment A and all of Segment D.

Alternative 14 would follow Segment A from the Sycamore Canyon Substation north for approximately 5.7 miles to the Chicarita Substation using existing SDG&E ROW. The route would then travel west-southwest for about 3.83 miles along existing unoccupied SDG&E ROW between the Chicarita Substation and the Peñasquitos Junction. A portion of this existing ROW is within the Del Mar Mesa Preserve. New overhead 230-kV structures would be installed along with new single-circuit 230-kV conductor in an area currently unoccupied by any electrical infrastructure, and new access roads and work pads would be required. Alternative 14 would not require any new or amended ROW. The alternative would utilize Segment D as included within the Proposed Project.

Alternative 14 would be installed above ground and would be approximately 3.9 miles shorter than the Proposed Project route, eliminating the 2.84-mile-long underground Segment B and

decreasing the length installed aboveground by about 1.06 miles compared to the Proposed Project. The overall length of the transmission line would decrease by approximately 23 percent and aboveground length would increase by 8 percent compared to the Proposed Project.

4.6.5.2 Consideration of CEQA Criteria

Project Objectives
Alternative 14 meets all of the project objectives by constructing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substation, comparable to the Proposed Project.

Technical, Legal, and Regulatory Feasibility
Construction of the alternative has the potential to be technically and legally feasible; however, the alternative has regulatory permitting uncertainty due to the presence of sensitive biological resources and construction within a City of San Diego MSCP Preserve.

Environmental Feasibility
Environmental Advantages
Potential environmental advantages of this alternative include:

- **Construction Impacts (Air Quality, Greenhouse Gases, Noise, Public Services, and Recreation).** Alternative 14 is shorter than the Proposed Project alignment, so construction-related impacts associated with air quality, greenhouse gases, noise, public services, and recreation would decrease.
- **Operational Impacts (Air Quality).** The reduced length of the alignment could result in slightly reduced activity level for maintenance of the transmission line and may reduce less than significant air quality emissions from maintenance of the Proposed Project.
- **Traffic and Transportation.** Alternative 14 would not include construction of underground transmission line within public roadways, and would therefore avoid the impacts associated with construction and operation of underground utilities within public roadways that would result from the Proposed Project.

Environmental Disadvantages
Potential environmental disadvantages include:

- **Land Use.** A portion of Alternative 14 would use existing unoccupied SDG&E ROW within the Del Mar Mesa Preserve (a City of San Diego MSCP Preserve), which could conflict with the City's MSCP.
- **Biological Resources.** Alternative 14 contains known sensitive biological resources, including vernal pools and other sensitive biological resources, and critical habitats and habitat preserve areas. A portion of the route is within the Del Mar Mesa Preserve. Construction would result in unavoidable direct impacts to known vernal pool resources and could potentially impact other sensitive biological resources, which would require consultation with the wildlife agencies (California Department of Fish and Wildlife [CDFW] and U.S. Fish and Wildlife Service [USFWS]). Suitable mitigation for direct impacts to these vernal pool features is

currently unknown, and these impacts are anticipated to be significant and unavoidable.

- **Aesthetics.** Alternative 14 would include the installation of approximately 19 new single-circuit 230-kV steel poles within existing, unoccupied SDG&E ROW. This segment is approximately 3.83 miles in length, and is located in close proximity to existing viewsheds and potential viewers. While the Proposed Project includes construction of new 230-kV steel structures along Segment A, these structures would replace existing 138-kV wood H-frame structures and would be located adjacent to existing 230-kV steel lattice towers and monopole structures. Alternative 14 would include similar structures as those included within Segment A of the Proposed Project; however, while Alternative 14 is within an existing utility ROW corridor, there are no existing structures within this ROW. The installation of new 230-kV structures (typical average height of 120 feet) where no similar structures currently exist would represent a greater change in the existing visual environment, and would result in comparatively greater adverse impact to aesthetic resources than the Proposed Project.

4.6.5.3 Conclusions

ELIMINATED. Alternative 14 was rejected because it would likely result in longer, uncertain permitting and mitigation requirements; therefore, the alternative may not meet regulatory feasibility. The alternative would also substantially increase the severity of biological and aesthetic/visual resources impacts of the Proposed Project.

4.6.6 Alternative 15: Southern Alignment Number 6 (SDG&E Application/PEA)

4.6.6.1 Description

Alternative 15 is 13.43 miles long, would not extend further north than the existing Chicarita Substation located south of SR-56, and would essentially replace the Proposed Project Segment B (undergrounding in Carmel Valley Road) and Segment C with an alternative underground alignment located south of SR-56. Alternative 15 would utilize approximately half of the alignment included as part of the Proposed Project, including about two-thirds of Segment A and all of Segment D.

Alternative 15 would follow Segment A from the Sycamore Canyon Substation north for 5.7 miles to the Chicarita Substation using existing SDG&E ROW. The transmission line would then transition underground and travel west-southwest for about 4.46 miles using a combination of existing unoccupied SDG&E ROW, franchise positions within existing streets, and new ROW between the Chicarita Substation and the Peñasquitos Junction. From approximately 500 feet southwest of the existing Chicarita Substation, Alternative 15 would travel west within existing, unoccupied SDG&E ROW for approximately 1.78 miles. The route would then be installed within Park Village Road (franchise position) for approximately 0.92 miles. Finally, the route would require new ROW for approximately 1.76 miles through the Los Peñasquitos Canyon Preserve until reaching the Peñasquitos Junction. The alternative would utilize Segment D as included within the Proposed Project.

Alternative 15 would be approximately 3.27miles shorter than the Proposed Project route. The length of transmission line installed underground would increase by approximately 1.62 miles, and the length installed aboveground would decreases by about 4.3 miles. The overall length of the transmission line would decrease by approximately 20 percent, the length of underground transmission line would increase by 57 percent, and aboveground length would decrease by 35 percent compared to the Proposed Project.

4.6.6.2 Consideration of CEQA Criteria

Project Objectives
Alternative 15 meets project objectives by constructing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations, comparable to the Proposed Project.

Technical, Legal, and Regulatory Feasibility
Alternative 15 has the potential to be technically and legally feasible; however, the alternative has regulatory permitting uncertainty due to the presence of sensitive biological resources and the new ROW that would be required in Los Peñasquitos Canyon Preserve.

Environmental Feasibility
Environmental Advantages
Alternative 15 is shorter than the Proposed Project alignment, and so construction and operation and maintenance-related impacts associated with air quality, greenhouse gases, noise, public services, and recreation would likely decrease slightly as compared with the Proposed Project.

Environmental Disadvantages
Potential environmental disadvantages from Alternative 15 include:

- **Land Use.** Alternative 15 would require approval of 1.76 miles of new ROW through Los Peñasquitos Canyon Preserve, which is currently designated as Open Space.
- **Biological Resources.** Alternative 15 contains known sensitive biological resources, including vernal pools and other sensitive biological resources, and critical habitats and habitat preserve areas. A portion of the route would require new ROW within the Los Peñasquitos Canyon Preserve, a City of San Diego MSCP Preserve. Underground transmission line construction within the MSCP Preserve would result in substantially greater impacts to biological resources and sensitive habitats. Construction would result in unavoidable direct impacts to known vernal pool resources and could potentially impact other sensitive biological resources, which would require consultation with the wildlife agencies (CDFW and USFWS).

4.6.6.3 Conclusions

ELIMINATED. Alternative 15 was rejected because it would likely result in longer, uncertain permitting and mitigation requirements. The alternative would also increase the severity of significant impacts to biological resources by resulting in substantially greater impacts from undergrounding within a City MSCP Preserve and causing direct impacts to sensitive vernal pool habitats located within the preserve.

4.6.7 Alternative 16: Underground Alignment Number 7 (SDG&E Application/PEA)

4.6.7.1 Description

Alternative 16 would connect the Sycamore Canyon and Peñasquitos Substations with a new, single-circuit underground 230-kV transmission line utilizing public roadways to the greatest extent possible. The underground alternative would include approximately 12.74 miles of new underground 230-kV transmission line within public roadways (i.e., franchise position) and approximately 2.53 miles of new underground 230-kV transmission line located within the boundaries of MCAS Miramar. The total length of Alternative 16 would be approximately 15.27 miles. The alternative would not use any of the Proposed Project segments. The underground alternative alignment would be generally west from the Sycamore Canyon Substation, and then generally north to the Peñasquitos Substation.

4.6.7.2 Consideration of CEQA Criteria

Project Objectives

Alternative 16 would meet project objectives by constructing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations, comparable to the Proposed Project.

Technical, Legal, and Regulatory Feasibility

Alternative 16 has the potential to be technically feasible. However, the alternative has legal and regulatory feasibility uncertainty since it would require 2.5 miles of a new easement from MCAS Miramar, triggering NEPA review and compliance.

Environmental Feasibility

Environmental Advantages

Potential environmental advantages of Alternative 16 include:

- **Aesthetics.** Alternative 16 would have substantially less impacts to aesthetic resources as the line would be located in an underground position and would not affect the permanent visual environment. Construction activities would be visible; however, these effects would be temporary.
- **Biological Resources.** Construction of the alternative within city streets would reduce habitat loss and impacts on sensitive species that could occur in the habitat areas that would be impacted by the Proposed Project.
- **Recreation.** Impacts to recreational facilities would be reduced because the alternative would avoid construction in Black Mountain Ranch Community Park

Environmental Disadvantages
Potential environmental disadvantages of Alternative 16 include:

- **Air Quality and Greenhouse Gas Emissions.** Underground Alignment Number 7 would be relatively more intensive due to the fact that the entire alignment would be underground. Underground construction takes longer and requires more equipment per mile than overhead construction. Therefore, relatively higher (and potentially more severe) construction-related impacts would be anticipated for air quality and greenhouse gas emissions compared to the Proposed Project.
- **Cultural Resources.** Although ground disturbance would primarily occur within city streets, the intensive amount of trenching could result in potential impacts to buried cultural and paleontological resources.
- **Traffic and Transportation.** Alternative 16 would include approximately 12.74 miles of underground construction within city streets (franchise position). Construction of an underground line within city streets creates potential impacts associated with traffic congestion and emergency vehicle access. Due to the extent of underground construction within city streets that would be included within the alternative, these impacts would be greater than those anticipated for the Proposed Project. In addition, the impacts to traffic congestion and emergency vehicle access could also be more severe (i.e., significant) due to localized conditions where construction would occur. These localized conditions can include existing traffic congestion, and intensive traffic generating land uses (e.g., high schools, large professional office buildings, or existing road design features [bottle necks, sharp turns, etc.]). Given the length of the alignment within city streets and the location (in the vicinity of the coastal zone and the I-5 Freeway), a potential for significant impacts is considered to be present.
- **Hazards and Utilities.** Operation of the transmission line within city streets could result in corrosion of parallel buried metallic utility pipelines (e.g., gas, fuel, or water pipelines).

4.6.7.3 Conclusions
ELIMINATED. Alternative 16 was rejected because it does not meet the criteria for regulatory feasibility due to the increased regulatory approval requirements on MCAS Miramar and associated schedule uncertainty. The alternative would reduce the significant aesthetic and biological resource impacts of the Proposed Project; however, it would result in increased air quality, cultural resource, traffic, hazards, and utility impacts.

4.6.8 Alternative 17: Stonebridge-Mira Mesa Alignment (CPUC)
4.6.8.1 Description
The Stonebridge-Mira Mesa Alignment would connect the Sycamore Canyon and Peñasquitos Substations with a new, single-circuit underground 230-kV transmission line utilizing public roadways. The Stonebridge-Mira Mesa Alignment follows Segment A from Sycamore Canyon Substation for a short distance to Stonebridge Parkway, near Stonecroft Terrace and Greenstone Court, and then transitions underground. At this point the alternative would follow

Stonebridge Parkway westerly to Pomerado Road, then west within Pomerado Road, which becomes Spring Canyon Road. Where Spring Canyon Road turns north, the route would follow Scripps Ranch Boulevard to the west and south to its intersection with Mira Mesa Boulevard. The alternative route then continues west in Mira Mesa Boulevard until just before I-805. At Vista Sorrento Parkway, the line would transition to overhead and follow an existing SDG&E ROW north to Peñasquitos Substation. The underground portion of the transmission line would be a total of 10.7 miles long and would include the construction of 33 vaults with manholes.

4.6.8.2 Consideration of CEQA Criteria

Project Objectives
The Stonebridge Mira-Mesa Alignment Alternative would meet would meet project objectives by constructing a new 230-kV transmission line between Sycamore and Peñasquitos Substations, comparable to the Proposed Project.

Feasibility
This alternative is potentially feasible and meets technical, legal, and regulatory feasibility criteria. Preliminary engineering was reviewed by the CPUC to evaluate utility congestion and there appears to be adequate space to construct the project within the existing roadways.

Environmental Advantages
Impacts associated with the construction of an overhead transmission line would be greatly reduced because the majority of this alternative would be located underground in City of San Diego roadways. Potential environmental advantages include:

- **Aesthetics.** Aesthetic impacts to residential areas would be reduced. Most of the impacts on Segment A and all of the impacts on Segments C and D would be avoided with the construction of an underground line.
- **Biological Resources.** This alternative avoids preserve areas and reduces impacts to biological resources and sensitive habitats by constructing the transmission line within existing paved roadways.
- **Noise.** This alternative would reduce corona noise impacts to residences along the overhead portions of the Proposed Project route.

Environmental Disadvantages
Potential environmental disadvantages include:

- **Air Quality and Greenhouse Gas Emissions.** Construction of an underground transmission line would result in a longer construction time frame; therefore, this alternative would result in greater impacts to air quality and would have more greenhouse gas emissions than the Proposed Project.
- **Hazards.** Because most of this alternative would be undergrounded, there could be additional hazards associated with emergency response during construction and potential AC interference on parallel buried metallic utility pipelines during operation.

- **Cultural Resources.** The increased underground construction would have greater potential impacts to buried cultural resources, human remains, or paleontological resources.
- **Traffic and Transportation.** The underground construction in a highly trafficked roadway would increase traffic impacts during construction and potential hazards to worker and vehicle safety due to construction on a road with high traffic volumes and high speed traffic, where there is already delays and poor level of service during peak hours.

4.6.8.3 Conclusions

ELIMINATED. The Stonebridge-Mira Mesa Alignment was eliminated because it would create greater significant impacts to traffic including increased safety hazards during construction than the Proposed Project. Alternative 5 also provides the same environmental advantages as this alternative, but involves construction on industrial roads west of I-15 where there are fewer sensitive receptors and where the roads are less heavily traveled than Mira Mesa; therefore this alternative is not analyzed further in the EIR.

4.6.9 Alternative 18: Los Rosas-Park Village Alignment (CPUC)

4.6.9.1 Description

The Los Rosas-Park Village Alignment follows SDG&E's proposed Segment A route from Sycamore Canyon Substation until the area of Chicarita Substation and then transitions underground. In lieu of using the existing SDG&E ROW at this point, the line would follow Calle De Las Rosas generally west to Salmon River Road, then north to Adolphia Street and continues west. Adolphia Street becomes Park Village Road and the route continues within the road until it ends near the Peñasquitos Junction, where the line would transition back to overhead and follow the existing SDG&E ROW similar to the proposed route.

4.6.9.2 Consideration of CEQA Criteria

Project Objectives

The alternative meets all project objectives by constructing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations.

Technical, Legal, and Regulatory Feasibility

This alternative potentially meets technical, legal, and regulatory feasibility requirements. The alternative would use two-lane roads with parking on either side (equivalent to a four-lane road with a 36-foot wide paved road surface). It is assumed that this alternative could potentially be technically feasible, although additional engineering would be necessary to verify utility congestion and actual construction location. This alternative would be constructed within City roadways and therefore potentially meets the regulatory and legal feasibility requirements because SDG&E has existing agreements with the City for construction within City roadways.

Environmental Feasibility

Environmental Advantages

This alternative would replace portions of Segment A and all of Segments B and C with an underground transmission line. This alternative would, therefore, avoid the impacts associated with construction of an overhead transmission line along portions of Segment A and all of Segment C. Potential environmental advantages include:

- **Aesthetics.** Because a larger amount of this line would be underground, the visual impacts of this alternative would be less than the proposed route including areas from Segment A to Carmel Valley Road and cable pole locations.
- **Biological Resources.** This alternative would avoid impacts to sensitive habitat in Black Mountain Ranch Preserve and Del Mar Mesa Preserve. This alternative would avoid potential impacts to vernal pools in Segment C.
- **Geology and Soils.** This alternative would reduce ground disturbance of undisturbed land, which would result in a reduction of potential impacts on soils and reduced potential for soil instability and erosion.
- **Noise.** This alternative would reduce corona noise impacts because more of the alignment would be located underground.

Environmental Disadvantages

Potential environmental disadvantages include:

- **Air Quality and Greenhouse Gases.** Construction of an underground transmission line would likely result in a longer construction time frame or more intense activity; therefore, this alternative would result in greater impacts to air quality and would have more greenhouse gas emissions than the Proposed Project.
- **Hazards.** Because this alternative would replace most of Segment D with an underground transmission line parallel to other buried metallic utility pipelines, there could be additional hazards associated with AC interference.
- **Cultural Resources.** The increased underground construction would have greater potential impacts to buried cultural resources, human remains, or paleontological resources.
- **Land Use.** Construction along narrow roads through residential communities would result in greater land use impacts than the Proposed Project.
- **Noise.** The alternative would have greater noise impacts by locating the underground transmission construction area near homes with sensitive receptors rather than in Carmel Valley Road, which is further set back from residential areas.
- **Traffic and Transportation.** This alternative would have increased traffic impacts on roadways due to an increase in underground construction near roadways.

4.6.9.3 Conclusions

ELIMINATED. The Los Rosas-Park Village Alignment Alternative would reduce significant aesthetic and biological resource impacts of the Proposed Project by avoiding construction of northern Segment A and all of Segments B and C. The alternative was eliminated from further analysis in the EIR because the alternative would result in substantially greater impacts on

traffic, land use, and greater potential hazards than the Proposed Project due to increased length of underground construction and construction in narrow roads within residential communities. Alternative 3 provides comparable reduction in environmental impacts and was selected for further analysis in the EIR instead of the Los Rosas-Park Village Alignment Alternative because Alternative 3 would be constructed primarily in arterial roadways (Mercy Road and Black Mountain Parkway) and further from sensitive receptors, whereas the Los Rosas-Park Village Alignment would be located in residential roadways.

4.6.10 Alternative 19: Sunrise Coastal Link Alignment (Sunrise Powerlink EIR/EIS)

4.6.10.1 Description

The Sunrise Coastal Link Alignment would follow proposed Segment A for approximately 6 miles overhead from Sycamore Canyon Substation to the area of Chicarita Substation just before SR-56. At this point, the 230-kV line would be placed underground in an existing SDG&E ROW for approximately 1.6 miles, heading west to an intersection with Park Village Road, then continue southwest underground in Park Village Road approximately 1 mile to the Los Peñasquitos Canyon Preserve. The underground line continues along a trail within the preserve for about 1.5 miles until it encounters the existing SDG&E North-South transmission corridor near Peñasquitos Junction. At this point, the line transitions to overhead and follows Segment D.

4.6.10.2 Consideration of CEQA Criteria

Project Objectives

The Sunrise Coastal Link Alignment meets all Project Objectives by constructing a new 230-kV transmission line between Sycamore and Peñasquitos Substations.

Technical, Legal, and Regulatory Feasibility

The alternative would be potentially technically feasible and potentially meet legal and regulatory feasibility criteria by locating the alignment within existing ROW and easements.

Environmental Feasibility

Environmental Advantages

Potential environmental advantages of this alternative include:

- **Aesthetics.** The Coastal Link Alignment would avoid additional poles and overhead line along Segment A between Chicarita Substation and Black Mountain Ranch Community Park. The alignment would avoid the cable pole within Black Mountain Ranch Community Park.
- **Recreation.** The Coastal Link alignment would avoid significant and unavoidable impacts to recreation within Black Mountain Ranch Community Park.

Environmental Disadvantages

Potential environmental disadvantages of this alternative include:

- **Air Quality and Greenhouse Gases.** Construction of an underground transmission line would result in a longer construction time frame with more intense vehicle

activity; therefore, this alternative would result in greater impacts to air quality and would have more greenhouse gas emissions than the Proposed Project.

- **Land Use.** The Sunrise Coastal Link Alignment would increase land use conflicts by placing the underground line within a residential community in a 50-foot-wide right-of-way between homes with greater impacts to the community of Rancho Peñasquitos.
- **Cultural Resources.** The increased underground construction would have greater potential impacts to buried cultural resources, human remains, or paleontological resources.
- **Public Health and Safety.** The alternative would have greater EMF, induced current, and electrical interference impacts by locating the 230-kV line within a 50-foot-wide right-of-way bordered by homes rather than in Carmel Valley Road, which is a major roadway that is set back from neighboring communities.
- **Noise.** The alternative would have greater noise impacts by locating the line in a residential area near sensitive receptors rather than in Carmel Valley Road.

4.6.10.3 Conclusions

ELIMINATED. The alternative would reduce significant aesthetic and biological resource impacts by avoiding construction of northern Segment A and all of Segments B and C of the Proposed Project. The alternative was eliminated due to higher air quality and greenhouse gas emissions, land use, public health and safety, and noise impacts than the Proposed Project.

4.6.11 Alternative 20: Pomerado Road to Miramar - Combination Underground/Overhead Alternative (Sunrise Powerlink EIR/EIS)

Description

The Pomerado Road to Miramar Area North-Combination Underground/Overhead Alternative would run overhead between Sycamore Canyon Substation and Stonebridge Trail within SDG&E's existing ROW. Just west of Stonebridge Trail, the transmission line would transition to underground and would follow Stonebridge Drive west to Pomerado Road. At Pomerado Road the route would turn south under Pomerado Road. The line would be attached to the Pomerado/Miramar Road bridge over I-15 or on an overhead structure crossing I-15. The route would continue westward under Miramar Road, and turn north on Carroll Road. The transmission line would follow Carroll Road/Carroll Canyon Road to SDG&E ROW at approximately I-805. A new cable pole would be constructed and the line would transition to overhead within the SDG&E ROW. The transmission line would be located on existing 230-kV TSPs within the SDG&E ROW heading north into the Peñasquitos Substation.

4.6.11.1 Consideration of CEQA Criteria

Project Objectives

The Pomerado Road to Miramar Area North-Combination Underground/Overhead Alternative would meet project objectives by constructing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations.

Technical, Legal, and Regulatory Feasibility
Similar to Alternative 5: Pomerado Road to Miramar Area North–Combined Underground/Overhead Alternative, Alternative 20 appears to be technically feasible based on a review of preliminary engineering and analysis of existing utilities buried within the alternative route; however, considerable effort could be required to design the alternative to avoid conflicts with other utilities and Carroll Canyon Creek. The alternative also potentially meets the regulatory and legal feasibility criteria by locating the transmission line in existing franchise ROW or SDG&E ROW. Similar to Alternative 5, the transmission line could cross I-15 overhead to avoid permitting and underground utility with the I-15 road crossing.

Environmental Feasibility
Environmental Advantages
Potential environmental advantages include:

- **Aesthetics.** Underground construction of the transmission line would substantially reduce or avoid the significant aesthetic impacts from the overhead transmission line in Segments A, C, and D of the Proposed Project.
- **Biological Resources.** This alternative would avoid impacts to biological resources within Black Mountain Ranch, Los Peñasquitos Canyon, and Del Mar Mesa Preserves. The alternative would also avoid impacts to vernal pools in Segments C and D of the Proposed Project.
- **Geology and Soils.** This alternative would reduce grading and the need for retaining walls.
- **Land Use.** This alternative would not construct most of the overhead transmission line in Segment A and none of the transmission line in Segments B, C, and D. This alternative would place 11.5 miles of the transmission line underneath roadways with only 2.8 total miles overhead. The portion of the alternative west of I-15 would be located in an industrial area with limited conflicts with existing land use. This alternative would reduce most overhead impacts in all the residential areas adjacent to the Proposed Project corridor including visual impacts, EMF concerns, and construction effects.
- **Noise.** This alternative would reduce corona noise impacts to residences along the overhead portions of the proposed route.
- **Recreation.** This alternative would avoid conflicts with constructing a cable pole in Black Mountain Ranch Community Park.

Environmental Disadvantages
This alternative has the following potential disadvantages:

- **Air Quality and Greenhouse Gases.** Construction of an underground transmission line would result in a longer construction time frame with more intense vehicle activity; therefore, this alternative would result in greater impacts to air quality and would have more greenhouse gas emissions than the Proposed Project.

- **Hazards.** Open trenches along Miramar Road could present hazards to vehicles and workers due to the high traffic volume on the road and high travel speed on the roadway. Because this alternative would replace most of the Proposed Project with an underground transmission line parallel to other utilities, there could be hazards associated with AC corrosion on buried metallic utility lines, particularly fuel pipelines near MCAS Miramar.
- **Hazardous Materials.** The alternative would be constructed in areas of known environmental contamination from leaking underground fuel tanks and in areas of potential contamination resulting from commercial, light industrial, and manufacturing activities. Underground construction would potentially cause exposure to the contamination.
- **Cultural Resources.** The increased underground construction would have greater potential impacts to buried cultural resources, human remains, or paleontological resources.
- **Traffic.** The increased underground construction within area roadways and construction in roadways with high traffic volume could increase traffic impacts relative to the Proposed Project.

4.6.11.2 Conclusions

ELIMINATED. This alternative would reduce significant aesthetic, biological resource, noise, and recreation impacts of the Proposed Project. This alternative would meet project objectives and potentially meets all feasibility criteria. Alternative 5 provides comparable reduction in environmental impacts by following a similar alignment to this alternative, but follows industrial roads in lieu of Miramar Road west of I-15. Alternative 5 would therefore have reduced impacts on traffic and hazards than construction of this alternative in Miramar Road. This alternative is therefore eliminated from further analysis in the EIR and Alternative 5 was carried forward for analysis in the EIR.

4.6.12 Alternative 21: Mannix-Dormouse Road Alternative (Sunrise Powerlink EIR/EIS)

4.6.12.1 Description

The Mannix-Dormouse Road Alternative follows proposed Segment A to Chicarita Substation, then travels west along a path north of and adjacent to single family residences along Mannix and Dormouse Roads in Rancho Peñasquitos. This alternative alignment includes an overhead 230-kV transmission line on double-circuit TSPs. The alternative would travel west through Los Peñasquitos Canyon Preserve to Peñasquitos Junction.

4.6.12.2 Consideration of CEQA Criteria

Project Objectives

The alternative would meet all of the project objectives by providing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations.

Technical, Legal, and Regulatory Feasibility
This alternative has the potential to be technically and legally feasible because the alternative would be located on TSPs within the existing SDG&E ROW. The alternative would traverse designated Critical Habitat and would potentially affect special-status species and would thus require coordination with USFWS and CDFW, which could delay the project timeline but the alternative would likely meet regulatory feasibility criteria.

Environmental Feasibility
Environmental Advantages
Potential environmental advantages include:

- **Recreation and Aesthetics.** This alternative would avoid conflicts with a cable pole located in Black Mountain Ranch Community Park.
- **Traffic and Circulation.** Because this alternative would avoid construction within Carmel Valley Road, this alternative would be expected to result in decreased short-term construction-related impacts to traffic along Carmel Valley Road.

Environmental Disadvantages
Potential environmental disadvantages include:

- **Aesthetics.** This alternative would result in increased visual impacts in the Rancho Peñasquitos community and would replace the underground portion of the Proposed Project with new overhead transmission line.
- **Biological Resources.** A portion of the alternative would cross through Los Peñasquitos Canyon Preserve and designated Critical Habitat. A portion would pass through designated open space in the City of San Diego Subarea V Planning Area. The following sensitive vegetation communities have been mapped along this alternative route: vernal pool, southern mixed chaparral, scrub oak chaparral, chemise chaparral, and southern maritime chaparral. A large vernal pool area begins in the vicinity of Structure C27 and continues along the alignment until just past Structure CA21. Endangered species have been mapped in the vernal pools including: San Diego mesa mint, San Diego button-celery, and San Diego fairy shrimp. The alternative would result in increased impacts to these vegetation communities within the preserve.
- **Land Use.** This alternative would create a potential land use incompatibility due to the presence of a new aboveground transmission line that would be located less than 100 feet from single family homes along Mannix and Dormouse Roads. The proximity of the 230-kV line to homes could also increase EMF-related concerns such as induced currents and shocks and radio/television/electrical equipment impacts.

4.6.12.3 Conclusions
ELIMINATED. This alternative would meet project objectives and has the potential to be technically and legally feasible. Regulatory feasibility would be based on consultation with USFWS and CDFW due to impacts to designated critical habitat and special-status species. This

route has been eliminated from full consideration in this EIR because of potentially significant visual impacts, impacts to vernal pools, critical habitat, and proximity to adjacent residences, which would be greater under this alternative than the Proposed Project; therefore, this alternative was eliminated from further consideration.

4.6.13 Alternative 22: SDG&E Segment 13 Scripps Ranch Alternative (Sunrise Powerlink EIR/EIS)

4.6.13.1 Description

The SDG&E Segment 13 Scripps Ranch Alternative would run parallel to the existing SDG&E ROW from Sycamore Canyon Substation to the Scripps Substation, and then would terminate at Peñasquitos Substation. The portion of the line from Scripps Substation to Peñasquitos Substation would follow Pomerado Road through a narrow and heavily traveled roadway through Scripps Ranch where no existing SDG&E ROW exists. This alternative would follow a road with schools, residences and commercial land uses. Portions of this alternative would require new ROW and MCAS Miramar lands would be affected.

4.6.13.2 Consideration of CEQA Criteria

Project Objectives

The alternative would meet all of the project objectives by providing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations.

Technical, Legal, and Regulatory Feasibility

This alternative would require new private ROW. Acquiring private ROW could require more condemnation and relocation of homes and businesses, which could thus delay the project in-service date. This alternative would encounter legal and regulatory constraints associated with crossing MCAS Miramar. Coordination with MCAS Miramar representatives during the Sunrise Powerlink project indicated that no alternative transmission path requiring new ROW on MCAS Miramar is feasible and none would be permitted due to National Defense Mission capability requirements (CPUC and BLM 2008). Although technically feasible, the construction phase of this alternative may involve road closures and/or a traffic management program due to the use of narrow and heavily traveled roadways.

Environmental Feasibility

Environmental Advantages

Potential environmental advantages include:

- **Aesthetics.** The alternative would reduce visual impacts by locating the transmission line in commercial and industrially developed areas that are less sensitive to aesthetic impacts. It would avoid aesthetic impacts associated with new TSPs and overhead transmission lines in Segments A, C, and D.
- **Recreation.** This alternative would avoid conflicts with constructing a cable pole in Black Mountain Ranch Community Park.

Environmental Disadvantages
Potential environmental disadvantages include:

- **Land Use.** With this alternative, new ROW would be required through the community of Scripps Ranch and near to Alliant International University, which could result in greater EMF-related concerns such as induced currents and shocks and radio/television/electrical equipment impacts and land use impacts on the residential community and university. This route is also longer than the project resulting in a greater exposure of the line and the potential incompatibilities with surrounding residential land uses.
- **Hazards and Hazardous Materials.** Hazardous materials contamination and/or exploding ordnances may be encountered due to ground-disturbing activities on MCAS Miramar.

4.6.13.3 Conclusions
ELIMINATED. The portion of this alternative on MCAS Miramar would not meet regulatory or legal feasibility criteria due to statements by MCAS Miramar that alternatives requiring new ROW on the base could not be permitted in order to preserve its National Defense Mission capabilities without degradation (CPUC and BLM 2008).

4.6.14 Alternative 23: MCAS Miramar - Underground/Overhead Alternative (Sunrise Powerlink EIR/EIS)

4.6.14.1 Description
Under the MCAS Miramar - Underground/Overhead Alternative, the transmission line would be located underground within existing roads on MCAS Miramar from the Sycamore Canyon Substation to I-805, staying within the base the entire distance. The line would exit the Sycamore Canyon Substation from the south following the path of a paved road named Spring Canyon. The line would continue underground in a southwest direction following Creek Road/Green Farms Road toward the direction of I-15. The line would cross I-15 south of the Miramar Way overpass on an existing bridge structure. The line would continue underground along the northern side of the base south of Miramar Road. Winding its way west, the line would remain north of the MCAS Miramar runways and continue all the way to I-805 where the line would transition to overhead and join the existing 230-kV ROW east of I-805 heading into the Peñasquitos Substation.

This line retains some design flexibility and could be underground or overhead as needed to avoid impacts to important resources or otherwise sensitive areas as identified by MCAS Miramar.

4.6.14.2 Consideration of CEQA Criteria

Project Objectives
The alternative would meet project objectives by providing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations.

Technical, Legal, and Regulatory Feasibility

The technology exists to construct, operate, and maintain this alternative; therefore, this alternative potentially meets the requirements for technical feasibility. The alternative would encounter legal and regulatory constraints associated with crossing MCAS Miramar. Coordination with MCAS Miramar representatives during the Sunrise Powerlink project indicated that no alternative transmission path on MCAS Miramar is feasible and none would be permitted due to National Defense Mission capability requirements (CPUC and BLM 2008). This alternative therefore does not meet the criteria for legal or regulatory feasibility.

Environmental Feasibility

Environmental Advantages

Potential environmental advantages include:

- **Aesthetics.** The alternative would reduce visual impacts by locating the underground line within a military base. It would avoid aesthetic impacts associated with new TSPs and overhead transmission lines in Segments A, C, and D.
- **Land Use.** This alternative would avoid impacts to residential communities because this alignment avoids residential areas entirely. Locating this line underground within MCAS Miramar would reduce the potential for land use incompatibilities, construction impacts and EMF-related concerns such as induced currents and shocks and radio/television/electrical equipment impacts due to the distance from residences in proximity to the buried line and primarily industrial and commercial land uses along the route.
- **Noise.** This alternative would eliminate corona noise impacts to residences along the overhead portions of the proposed route, as the line would not traverse through residential areas.
- **Recreation.** This alternative would avoid conflicts with constructing a cable pole in Black Mountain Ranch Community Park, as this pole would not be necessary.
- **Transportation and Traffic.** The alternative would reduce impacts to traffic by undergrounding the line within less traveled roadways in MCAS Miramar instead of undergrounding within Carmel Valley Road.

Environmental Disadvantages

Potential environmental disadvantages include:

- **Air Quality and Greenhouse Gases.** Construction of an underground transmission line would result in a longer construction time frame with more intense vehicle activity; therefore, this alternative would result in greater impacts to air quality and generate more greenhouse gas emissions than the Proposed Project.
- **Biological Resources.** Impacts to biological resources within MCAS Miramar could occur under this alternative due to the surface disruption associated with construction of the underground segments.

- **Land Use.** Increased land use incompatibilities may occur with MCAS Miramar due to the ongoing activities at the Air Station, future land use planning efforts, and heightened security measures now in place.
- **Hazards and Hazardous Materials.** Hazardous materials contamination and/or exploding ordnances may be encountered due to ground-disturbing activities on MCAS Miramar.

4.6.14.3 Conclusions

ELIMINATED. The portion of this alternative on MCAS Miramar would not be feasible to permit due to statements by MCAS Miramar that alternatives on the base requiring new ROW could not be permitted in order to preserve its National Defense Mission capabilities (CPUC and BLM 2008). This alternative therefore does not meet regulatory or legal feasibility criteria and has been eliminated from full consideration in the EIR.

4.6.15 Alternative 24: MCAS Miramar - Combination Underground/Overhead Alternative (Sunrise Powerlink EIR/EIS)

4.6.15.1 Description

Under the MCAS Miramar - Combination Underground/Overhead Alternative, the line would exit Sycamore Canyon Substation to the south and would be located overhead following the alignment of existing roads on MCAS Miramar to Pomerado Road, where the line would transition underground. Under this alternative, the rest of the alignment would then follow either Pomerado Road to Miramar Area North–Combination Underground/Overhead Alternative (Alternative 20) or MCAS Miramar–Underground and Underground/Overhead Alternative (Alternative 23) approaching the Peñasquitos Substation from the south along the existing 230-kV ROW east of I-805.

This line retains some design flexibility and could be underground or overhead as needed to avoid impacts to important resources or otherwise sensitive areas as identified by MCAS Miramar.

4.6.15.2 Consideration of CEQA Criteria

Project Objectives

The alternative would meet all of the project objectives by providing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations.

Technical, Legal, and Regulatory Feasibility

The technology exists to construct, operate, and maintain this alternative; therefore, this alternative meets the requirements for technical feasibility. The alternative would encounter legal and regulatory constraints associated with crossing MCAS Miramar. Coordination with MCAS Miramar representatives during the Sunrise Powerlink Project indicated that no alternative transmission path on MCAS Miramar is feasible and none would be permitted due to National Defense Mission capability requirements (Miramar 2007). This alternative therefore does not meet the criteria for legal or regulatory feasibility.

Environmental Feasibility

Environmental Advantages

Potential environmental advantages include:

- **Aesthetics.** The alternative would reduce visual impacts by locating the transmission line within a military base where viewer sensitivity to transmission lines would likely be less than in residential communities and open space recreational areas.
- **Land Use.** This alternative would avoid impacts to residential communities because this alignment avoids residential areas entirely. Locating this line underground within MCAS Miramar would reduce the potential for land use incompatibilities, construction impacts and EMF-related concerns such as induced currents and shocks and radio/television/electrical equipment impacts due to the distance from residences in proximity to the buried line and primarily industrial and commercial land uses along the route.
- **Noise.** This alternative would eliminate corona noise impacts to residences along the overhead portions of the proposed route, as there are no residences within this alignment.
- **Recreation.** This alternative would avoid conflicts with constructing a cable pole in Black Mountain Ranch Community Park.
- **Transportation and Traffic.** The alternative would reduce impacts to traffic by undergrounding the line within less traveled roadways in MCAS Miramar instead of undergrounding within Carmel Valley Road.

Environmental Disadvantages

Potential environmental disadvantages include:

- **Air Quality and Greenhouse Gases.** Construction of an underground transmission line would result in a longer construction time frame with more intense vehicle activity; therefore, this alternative would result in greater impacts to air quality and would generate more greenhouse gas emissions than the Proposed Project.
- **Biological Resources.** Impacts to biological resources within MCAS Miramar could occur under this alternative due to the surface disruption during construction. Sensitive biological resources in Carroll and Fenton Canyons could also be adversely affected.
- **Hazards and Hazardous Materials.** Hazardous materials contamination and/or ordnances may be encountered due to ground-disturbing activities on MCAS Miramar.
- **Land Use.** Increased land use incompatibilities may occur with MCAS Miramar due to the ongoing activities at the Air Station, future land use planning efforts, and heightened security measures now in place.

4.6.15.3 Conclusions

ELIMINATED. This alternative would meet project objectives and would be potentially technically feasible similar to the Proposed Project. The portion of this alternative on MCAS Miramar would not be feasible due to a statement by MCAS Miramar that alternatives requiring new ROW on the base could not be permitted in order to preserve its National Defense Mission capabilities without degradation (CPUC and BLM 2008). Therefore, this alternative has been eliminated from full consideration in the EIR.

4.6.16 Alternative 25: Rancho Peñasquitos Boulevard Bike Path Alternative (Sunrise Powerlink EIR/EIS)

4.6.16.1 Description

The Rancho Peñasquitos Boulevard Bike Path Alternative follows Segment A to Chicarita Substation. From Chicarita Substation, the route would head north for approximately 200 feet and then would transition underground near the entrance to the bike path at Rancho Peñasquitos Boulevard. This alternative would run along the south side of SR-56 until the elevation of the bike path meets up with SDG&E's ROW, approximately 0.25 mile west of Rancho Peñasquitos Boulevard. The transmission line would remain underground within SDG&E ROW along Los Peñasquitos Canyon continuing westward to Peñasquitos Junction. From Peñasquitos Junction, the alternative would follow the overhead alignment for Segment D.

4.6.16.2 Consideration of CEQA Criteria

Project Objectives

The alternative would meet all of the project objectives by providing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations.

Technical, Legal, and Regulatory Feasibility

This alternative has the potential to be technically and legally feasible. The bike path property is owned by Caltrans. Caltrans' general policy on use of its controlled access roadways does not permit longitudinal encroachments (Caltrans 2013). SDG&E would have to show that there are no other potential alignment options, in which case Caltrans would work with the applicant through the Exception Permit Process. However, because other alignment options exist (as described throughout this Alternatives Screening Report and with the Proposed Project), Caltrans would not allow an Exception Permit for this alternative. Thus, this alternative does not pass the regulatory feasibility screening criteria.

Environmental Feasibility

Environmental Advantages

Potential environmental advantages include:

- **Aesthetics.** The transmission alignment would avoid new poles and aesthetic impacts in the northern portion of Segment A and within Black Mountain Ranch Community Park.

- **Recreation.** The alternative would avoid construction and operational impacts at Black Mountain Ranch Community Park by locating the transmission line south of the park.

Environmental Disadvantages
Potential environmental disadvantages include:

- **Biological Resources.** This alternative involves substantially greater impacts to sensitive biological resources and habitat communities in Los Peñasquitos Canyon Preserve due to undergrounding within the preserve.
- **Land Use.** This alternative may have an increased short-term impact on recreational users of the bike path during construction and increased EMF-related concerns such as induced currents and shocks and radio/television/electrical equipment impacts due to its proximity to residences adjacent to the SR-56 bike path.

4.6.16.3 Conclusions
ELIMINATED. The portion of this alternative within the SR-56 ROW would not be feasible to permit due to Caltrans regulations. Therefore, this alternative has been eliminated from full consideration in the EIR, because it does not meet the regulatory feasibility criteria.

4.6.17 Alternative 26: State Route 56 Alternative (Sunrise Powerlink EIR/EIS)
4.6.17.1 Description
The State Route 56 Alternative follows Segment A to the Chicarita Substation. From there, the alternative would transition underground near Rancho Peñasquitos Boulevard at the SR-56 overpass. This alternative would locate the transmission line under the median of SR-56 until it would reach the existing overhead lines north of the western terminus of Park Village Drive. The line would continue south overhead along this existing transmission line ROW until rejoining Segment D.

4.6.17.2 Consideration of CEQA Criteria

Project Objectives
The alternative would meet project objectives by providing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations.

Technical, Legal, and Regulatory Feasibility
Though construction could be difficult in the heavily traveled SR-56, this alternative has the potential to be technically and legally feasible. This alternative would be infeasible from a regulatory standpoint as it is inconsistent with Caltrans regulations, which prohibit longitudinal encroachments into Caltrans ROW along limited access roadways, such as SR-56. Please refer to the Rancho Peñasquitos Bike Path Alternative (Alternative 26) for a discussion of Caltrans regulations.

Environmental Feasibility

Environmental Advantages

Potential environmental advantages include:

- **Land Use.** This alternative would reduce impacts to residential areas by following SR-56 ROW. Locating the line within SR-56 would reduce the potential for land use incompatibilities and EMF-related concerns such as induced currents and shocks and radio/television/electrical equipment impacts for residences along the northern portion of Segment A and near the underground line of the proposed route.

Environmental Disadvantages

Potential environmental disadvantages include:

- **Transportation and Traffic.** Short-term construction-related traffic impacts under this alternative would be expected to increase due to the magnitude of the volume of total daily vehicle trips traveling on SR-56 between I-15 and I-5. Long-term maintenance over the operational life of this alternative may also result in circulation impacts to users of SR-56.

4.6.17.3 Conclusions

ELIMINATED. This alternative does not meet regulatory feasibility criteria due to conflicts with Caltrans regulations for limited access roadways. Therefore, this alternative has been eliminated from full evaluation in this EIR.

4.6.18 Alternative 27: MP 146.5 to Peñasquitos Substation Underground/Consolidation Alternative (Sunrise Powerlink EIR/EIS)

4.6.18.1 Description

Under the MP 146.5 to Peñasquitos Substation Underground/Consolidation Alternative, the line would remain underground from Chicarita Substation all the way to the Peñasquitos Substation. In addition, this alternative would include undergrounding and consolidation of all existing electrical 69-kV and 138-kV transmission lines along the segment from Peñasquitos Junction to the Peñasquitos Substation, including H-frame structures and lattice towers.

4.6.18.2 Consideration of CEQA Criteria

Project Objectives

The alternative would meet all of the project objectives by providing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations.

Technical, Legal, and Regulatory Feasibility

This alternative has the potential to be technically feasible. Burial of the project transmission lines along with burial of two existing aboveground lines (69-kV and 138-kV) within the Los Peñasquitos Canyon Preserve would not be legally feasible because it would require burial of existing transmission lines not affected by the project. It is not legally feasible to require SDG&E to reduce impacts on power lines that would not be affected by the Proposed Project.

The alternative would also involve substantial impacts within a MSCP Preserve which would require approval from CDFW and USFWS and could result in regulatory delays.

Environmental Feasibility

Environmental Advantages

Potential environmental advantages include:

- **Aesthetic Resources.** The alternative avoids overhead power lines and associated visual impacts in the northern portion of Segment A and all of Segments C and D. The alternative would improve the baseline environment by undergrounding existing overhead transmission lines.

Environmental Disadvantages

Potential environmental disadvantages include:

- **Air Quality and Greenhouse Gases.** Construction of an underground transmission line would result in a longer construction time frame with more intense vehicle activity; therefore, this alternative would result in greater impacts to air quality and would have more greenhouse gas emissions than the Proposed Project.
- **Biological Resources.** Additional ground disturbance that would occur under this alternative due to burying all existing transmission lines, and structures within the existing ROW would result in greater potential impacts to biological resources within Los Peñasquitos Canyon Preserve.
- **Cultural Resources.** Additional ground disturbance that would occur under this alternative from burying all existing transmission lines and structures within an existing ROW would result in greater potential impacts to cultural resources within Los Peñasquitos Canyon Preserve.
- **Geology and Soils.** Additional ground disturbance within the Los Peñasquitos Canyon Preserve that would occur under this alternative from undergrounding three transmission lines on steep slopes would result in additional impacts to soils and increased erosion.
- **Hydrology and Water Quality.** The additional ground disturbance associated with undergrounding three transmission lines on steep slopes could result in drainage impacts and additional impacts to water quality associated with erosion.

4.6.18.3 Conclusions

ELIMINATED. This alternative would meet project objectives and has the potential to be technically feasible; however, the alternative would be legally infeasible because it would require burial of existing transmission lines not affected by the project. This undergrounding/consolidation of existing electrical transmission lines, especially on steep slopes within the ROW, could also cause additional impacts biological and cultural resources, soil, and water quality within Los Peñasquitos Canyon Preserve. Therefore, this alternative has been eliminated from full evaluation in the EIR.

4.6.19 Alternative 28: Scripps Poway Parkway to State Route 56 Alternative (Sunrise Powerlink EIR/EIS)

4.6.19.1 Description

Under the Scripps Poway Parkway to State Route 56 Alternative, the line would exit Sycamore Canyon Substation and would transition to underground beneath Scripps Poway Parkway. The underground line would continue in a northwest direction toward the Chicarita Substation and SR-56. The line would remain underground and would be located beneath SR-56. The line would continue westward under SR-56 and could turn south at either of the two existing transmission line corridors that intersect SR-56. The route would head south along an existing SDG&E ROW into the Peñasquitos Substation.

4.6.19.2 Consideration of CEQA Criteria

Project Objectives

The alternative would meet project objectives by providing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations.

Technical, Legal, and Regulatory Feasibility

Though construction could be difficult in the heavily traveled SR-56, this alternative has the potential to be technically and legally feasible. This alternative would be infeasible from a regulatory standpoint as it is inconsistent with Caltrans regulations, which prohibit longitudinal encroachments into Caltrans ROW along limited access roadways, such as SR-56. Please refer to the Rancho Peñasquitos Bike Path Alternative (Alternative 26) for a discussion of Caltrans regulations.

Environmental Feasibility

Environmental Advantages

Potential environmental advantages include:

- **Aesthetic Resources.** Installing more of the line underground would reduce the visual impacts of Segment A and avoid impacts at Segment D.
- **Biological Resources.** This alternative would reduce impacts on biological resources contained within the Black Mountain Ranch, Del Mar Mesa and Los Peñasquitos Canyon Preserves due to avoidance of these areas.
- **Land Use.** This alternative would avoid impacts to residential areas along Segments A and D, because this alignment avoids these areas by heading to the north along an existing ROW to SR-56. Locating the line within SR-56 would reduce potential residential land use incompatibilities and EMF-related concerns such as induced currents and shocks and radio/television/electrical equipment impacts.

Environmental Disadvantages

Potential environmental disadvantages include:

- **Air Quality and Greenhouse Gases.** Construction of an underground transmission line would result in a longer construction time frame with more intense vehicle

activity; therefore, this alternative would result in greater impacts to air quality and would have more greenhouse gas emissions than the Proposed Project.
- **Cultural Resources.** The increased underground construction would have a greater potential to damage buried cultural resources, human remains, or paleontological resources.
- **Transportation and Traffic.** Installing more of the line underground would increase short-term traffic and circulation impacts and long-term operational impacts on traffic.

4.6.19.3 Conclusions

ELIMINATED. This alternative does not meet the regulatory feasibility criteria due to conflicts with Caltrans regulations for limited access roadways. Therefore, this alternative has been eliminated from full evaluation in the EIR.

4.6.20 Alternative 29: Scripps Poway Parkway-Pomerado Road Underground Alternative (Sunrise Powerlink EIR/EIS)

4.6.20.1 Description

Under the Scripps Poway Parkway-Pomerado Road Underground Alternative, the line would exit the Sycamore Canyon Substation and follow Segment A to Pomerado Road. From there the line would transition underground beneath Pomerado Road, heading northward to Poway Road. At Poway Road, the line would continue underground in a westerly direction where it would rejoin Segment A, as proposed heading into the Chicarita Substation. The alternative would follow the proposed alignments of Segments A, B, C, and D from Chicarita Substation to Peñasquitos Junction.

4.6.20.2 Consideration of CEQA Criteria

Project Objectives

The alternative would meet all of the project objectives by providing a new 230-kV transmission line between Sycamore Canyon and Peñasquitos Substations.

Technical, Legal, and Regulatory Feasibility

This alternative has the potential to be technically feasible. It would also potentially meet legal and regulatory feasibility requirements by constructing the transmission line in roadways where SDG&E has existing franchise rights.

Environmental Feasibility

Environmental Advantages

Potential environmental advantages include:

- **Aesthetic Resources.** The portion of the line east of I-15 would be underground, thereby reducing potential visual effects of the project as experienced by residents in Rolling Hills.

- **Land Use.** This alternative would avoid land use incompatibility impacts to residences within the Rolling Hills community because it would be undergrounded in this area.

Environmental Disadvantages
Potential environmental disadvantages include:

- **Aesthetic Resources.** Additional transition structures at Pomerado Road and Chicarita Substation would create additional visual impacts in a residential community.
- **Air Quality and Greenhouse Gases.** Construction of an underground transmission line would result in a longer construction time frame with more intense vehicle activity; therefore, this alternative would result in greater impacts to air quality and would have more greenhouse gas emissions than the Proposed Project.
- **Cultural Resources.** The increased length of underground construction would have a greater potential to damage buried cultural resources, human remains, or paleontological resources.
- **Transportation and Traffic.** Traffic impacts under this alternative could be increased in the short term due to the increased burial length of the transmission line beneath heavily traveled roadways.

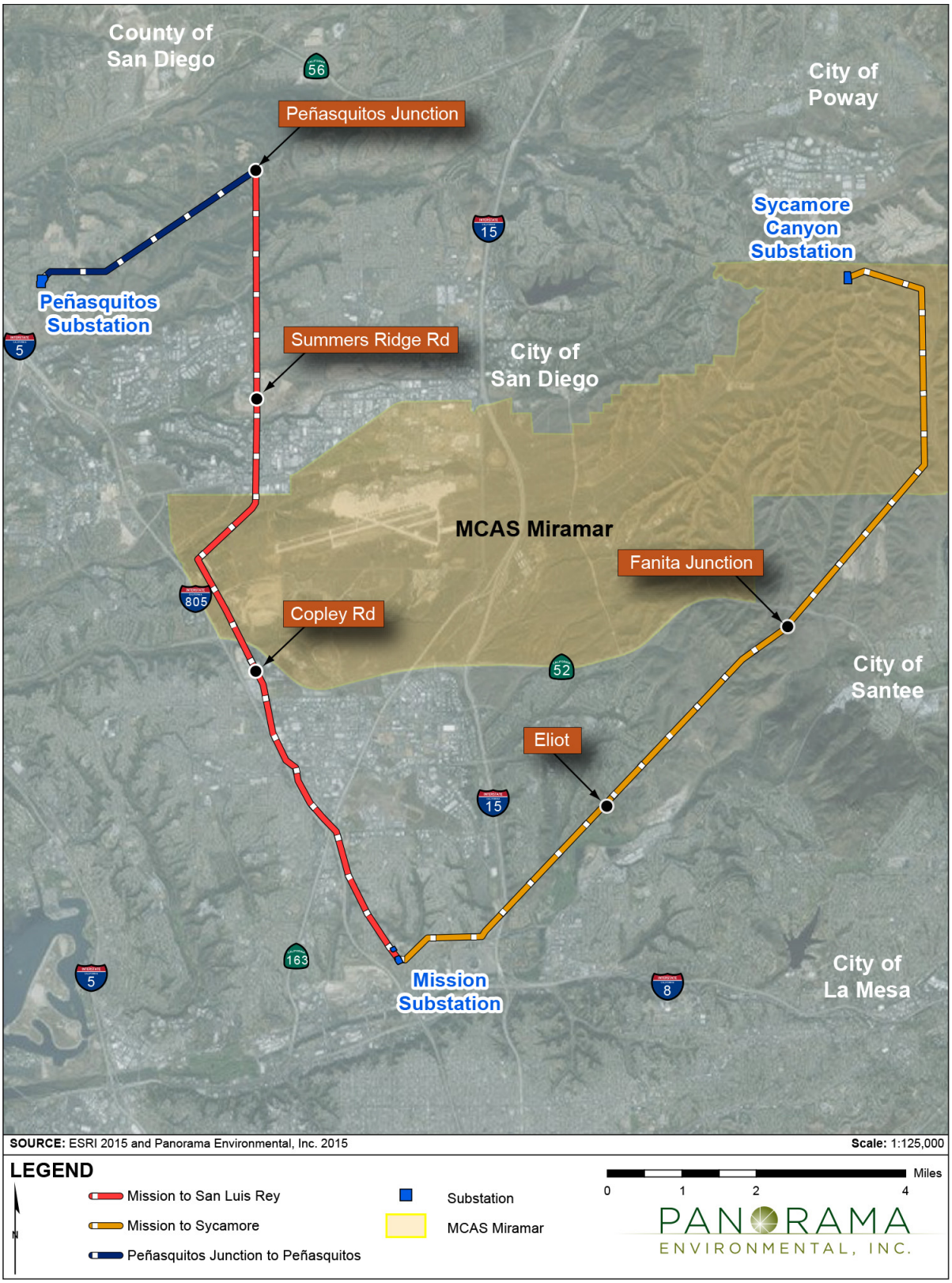
4.6.20.3 Conclusions
ELIMINATED. This alternative would meet all of the project objectives and is potentially feasible; however, it would cause greater short-term traffic impacts and would not substantially reduce an environmental impact because of the limited area of reduction in new TSPs and transmission lines. Therefore, the Scripps Poway Parkway–Pomerado Road Underground Alternative has been eliminated from full consideration in the EIR.

4.7 ELECTRICAL SYSTEM ALTERNATIVES ELIMINATED
Electrical system alternative transmission corridors are shown on Figure 4.7-1.

4.7.1 Alternative 30: CAISO-Approved Mission – Peñasquitos 230-kV Transmission Line (CAISO; ORA)
4.7.1.1 Description
The CAISO-approved Mission – Peñasquitos 230-kV transmission line alternative would construct a new 230-kV transmission line between Mission Substation and Peñasquitos Substation. This alternative is approximately 15 miles and consists of four segments:

- Mission Substation to Copley Drive and San Clemente Canyon Freeway
- Copley Drive and San Clemente Canyon Freeway to Summer Ridge Road and Camino Santa Fe
- Summer Ridge Road and Camino Santa Fe to Peñasquitos Junction
- Peñasquitos Junction to Peñasquitos Substation

Figure 4.7-1 Electrical System Alternative Transmission Corridors



The construction within each segment is described below based on a description of the alternative location from CAISO and cross-sections from SDG&E. Cross-sections of these segments are provided in Attachment B.

From Mission Substation to Copley Drive and San Clemente Freeway, approximately 4.3 miles, the alternative would involve bundling the Mission-San Luis Rey 230-kV lines (TL 23001 and TL 23004) on the eastern side of the existing steel lattice towers and tubular steel poles and the new Mission – Peñasquitos Line would then be installed on the western side of the existing structures.

From the area of Copley Drive and San Clemente Canyon Freeway to the area of Summer Ridge Road and Camino Sante Fe, approximately 4.2 miles, the alternative would require removing two sets of single-circuit wood H-Frame structures and replacing the structures with steel H-frame structures to maintain a low-profile in proximity to MCAS Miramar airport. This alternative would remove 56 wood H-frames and install 56 steel H-Frames.

From the area of Summer Ridge Road and Camino Santa Fe to Peñasquitos Junction the alternative would involve bundling TL 23001 and TL 23004 on the eastern side of the existing steel lattice towers for a distance of about 3.2 miles. The new Mission – Peñasquitos Line would then be installed on the western side of the existing structures.

From Peñasquitos Junction to Peñasquitos Substation, the new 230-kV transmission line would be installed comparable to Segment D of the Proposed Project; however, the 69-kV circuits could be underground in Carmel Mountain Road as described in Alternative 4: 69-kV partial underground alternative, to create a new position on the steel structures and avoid installing new 69-kV TSP for 2.8 miles. This alternative would require approximately 15 miles of new transmission line and avoid construction of Segments A, B, and C (13.3 miles of new transmission line).The Mission – Peñasquitos transmission corridor via Mission – Peñasquitos Junction and Peñasquitos Junction – Peñasquitos Substation is shown on Figure 4.7-1.

This alternative would also involve reconductoring the Sycamore – Scripps and Poway – Pomerado lines as mitigation for thermal overloads. However, the Miguel – Mission 230-kV lines are loaded to 99% in 2024 and may need reconductoring by 2025.

4.7.1.2 Consideration of CEQA Criteria

Project Objectives

A single Mission-Peñasquitos 230-kV transmission line does not meet any of the objectives of delivering energy more efficiently to the load center in San Diego or increasing delivery of renewable energy the Proposed Project. The ability for the alternative to meet project objectives including improving grid reliability and deliverability of renewable energy was evaluated by the CPUC (refer to Attachment A). The results of the CPUC's analysis show that the alternative does not achieve the same electrical benefits as the Proposed Project and a range of additional electrical upgrades would be required to address thermal overloads. Even with these additional upgrades, the alternative would not meet most of the project objectives because it would not

improve deliverability of renewable energy in SDG&E's RPS portfolio and it would not deliver energy efficiently to the load center.

Technical, Legal, Regulatory, and Environmental Feasibility
The technical, legal, regulatory, and environmental feasibility of this alternative have not been considered because this alternative does not meet most of the Proposed Project's basic objectives.

4.7.1.3 Conclusions
ELIMINATED. This alternative does not meet any of the basic project objectives; therefore, the alternative has been eliminated from full consideration in this EIR.

4.7.2 Alternative 31: CAISO-Approved Mission – Peñasquitos 230-kV Transmission Line and New Sycamore – Mission 230-kV Transmission Line (CPUC)

4.7.2.1 Description
The CAISO-approved Mission – Peñasquitos 230-kV transmission line and new Sycamore – Mission 230-kV transmission line alternative would construct a new 230-kV transmission line between Sycamore Canyon Substation and Mission Substation and new transmission line between Mission Substation and Peñasquitos Substation. The new transmission line between Sycamore Canyon and Mission Substations would be located within SDG&E's easement on MCAS Miramar and SDG&E's existing ROW within the City of San Diego Mission Trails Regional Park and the communities of Tierrasanta, Serra Mesa, and Mission Valley. The Sycamore – Mission portion of the alternative consists of four segments:

- Sycamore Substation to Fanita Junction,
- Fanita Junction to Elliott,
- Elliott to I-15, and
- I-15 to Mission Substation.

The construction within each segment is described below based on cross-sections from SDG&E. Cross-sections of the segments are provided in Attachment B.

From Sycamore Substation to Fanita Junction, approximately 6.4 miles, the Sycamore – Mission transmission line would require removal of existing steel lattice towers and construction of two new 230-kV transmission lines on 230-kV TSPs within MCAS Miramar. This alternative would also remove 29 steel lattice towers and install 58 230-kV TSPs; 42 temporary structures for shoo-flies.

From Fanita Junction to Elliott, approximately 3.3 miles, existing double-circuit 138-kV steel lattice towers would be removed and replaced with new double-circuit 230-kV tubular steel poles. Existing 138-kV transmission lines on the steel lattice tower would be bundled and placed on one side of the poles to open a space for the new 230-kV transmission line on the other side of the poles. This alternative would remove 18 steel lattice towers and install 18 230-kV TSPs; it would also install 22 temporary structures for shoo-flies.

From Elliott to I-15, approximately 2 miles, an existing wood pole supporting a distribution line would be replaced with a double circuit TSP, a 69-kV power line on the existing steel lattice tower would be relocated to the new TSP in a split phase arrangement, and the existing distribution line on the wood poles would be located as underbuild on the new TSP. The existing double-circuit 138 kV steel lattice towers between Elliott and I-15 would be removed and replaced with new double-circuit 230-kV tubular steel poles. An existing 138-kV transmission line on the steel lattice tower would be placed on one side of the poles and the new 230-kV transmission line would be placed on the other side of the poles. This alternative would remove 8 138-kV steel lattice towers and 8 distribution poles and install 8 230-kV TSPs and 8 69-kV poles; it would also install 13 temporary structures for shoo-flies.

From I-15 to Mission, for approximately 1.8 miles, an existing double circuit 138-kV lattice steel tower would be removed and replaced with a double-circuit 230-kV TSP and an existing 69-kV wood H-frame would be removed and replaced with a double-circuit 69-kV TSP. Existing circuits would be re-arranged resulting in an open position of the 230 kV TSP for the new 230-kV Mission to Sycamore line. This alternative would remove 7 138-kV steel lattice towers, 7 H-frames, and 7 69-kV poles and install 7 230-kV TSPs and 7 double-circuit 69-kV poles; it would also install 24 temporary structures for shoo-flies.

The Mission to Peñasquitos portion of the alternative would be constructed in the same manner as described in Alternative 30, above.

4.7.2.2 Consideration of CEQA Criteria

Project Objectives

The combined Mission – Peñasquitos and Sycamore – Mission transmission lines meet all of the project objectives. The ability for the alternative to meet project objectives including improving grid reliability and deliverability of renewable energy was evaluated by the CPUC (refer to Attachment A). The alternative would improve grid reliability, deliverability of renewable energy, and would efficiently deliver energy to the load center by adding additional capacity on a higher voltage line between Sycamore Canyon and Peñasquitos Substations via Mission Substation. This alternative is electrically comparable to the Proposed Project.

4.7.2.3 Technical, Regulatory and Legal Feasibility

The transmission line is potentially feasible, but requires reconstructing a number of lines and replacing a number of existing structures in the Sycamore – Mission Segment and the Mission – Peñasquitos Junction Segment to construct the transmission line within SDG&E's existing easement from MCAS Miramar and within existing SDG&E ROW. The alternative would meet regulatory and legal feasibility criteria with the structure replacements because the alternative is not expected to require a new easement from MCAS Miramar.

4.7.2.4 Potentially Reduced Environmental Impacts

- **Traffic** –The alternative would avoid underground construction in Segment B and would thereby reduce traffic impacts from construction of the underground transmission line

- **Aesthetics** – The alternative avoids new TSPs and overhead transmission construction in Segment A of the Proposed Project
- **Recreation** – The alternative avoids impacts to recreation in Sycamore Canyon Park and Black Mountain Ranch Community Park because no construction would take place in Segments A or B of the Proposed Project
- **Noise** – The alternative could reduce noise impacts on schools because of the greater distance between the transmission line and the nearest schools in the alternative alignment

4.7.2.5 Potentially Increased Environmental Impacts

- **Air Quality and Greenhouse Gases** – The longer alignment alternative (28 miles versus 16 miles for the Proposed Project) and additional construction activity due to shoo-flies,steel structure removals and replacements in the Sycamore-Mission segment would require greater total construction equipment hours for additional structure installation/removal and conductor stringing, which would result in greater overall emissions of criteria pollutants and greenhouse gases. The increased air quality emissions could result in more severe (i.e., more significant) effects as any increase in the amount of equipment operating simultaneously would increase the maximum daily emissions of criteria pollutants, thereby increasing the severity of the effects.
- **Aesthetics** – The alternative would increase the number and height of poles by rebuilding existing structures and adding new TSPs in the Mission-Sycamore Segment. The alternative would likely increase the number of segments requiring marker balls due to new line in areas with steep canyons. The alternative would impact viewsheds in Mission Trails Regional Park and residential areas in Tierra-Santa, and Mission Valley.
- **Biological Resources** – The alternative would require additional temporary and permanent impact areas, including temporary structure work areas, permanent structure maintenance pads, and temporary stringing sites. These increased impact areas would result in greater impacts to biological resources compared to the Proposed Project. Impacts to sensitive vegetation communities would increase proportionately with the length of the proposed route in habitat areas. The alternative would require new structures in Mission Trails Open Space Preserve, mapped habitat area for Quino checkerspot butterfly (Ebbin Moser and Skaggs 2007) and critical habitat for San Diego fairy shrimp (USFWS 2015).
- **Cultural and Paleontological Resources** – The alternative would result in a larger impact area due to the additional pole installation and removals when compared to the Proposed Project. Therefore, the potential for impacts to cultural, historical, and paleontological resources would increase in general proportion to the increase in impact area.
- **Recreation** – The alternative would increase construction in recreational areas, specifically Mission Trails Regional Park.
- **Noise** – Noise impacts would increase due to the longer alignment length and the longer construction timeframe with potential increased use of helicopters due to

steep terrain. The number of sensitive receptors in proximity to the alignment would increase due to the residential development in proximity to the Mission-Peñasquitos segment.

- **Hydrology and Geology**– The alternative requires more surface disturbance due to increased pole removals and new pole installations, particularly on steep slopes. The potential for erosion and sedimentation and number of retaining walls would increase proportional to the area of disturbance and construction in areas of steep slopes.

4.7.2.6 Conclusions

ELIMINATED. This alternative would meet all of the project objectives and is potentially feasible; however, it would not reduce overall environmental impacts because it would require more new poles and structures and would result in a longer alignment with greater impacts than the Proposed Project. Therefore, the CAISO-Approved Mission – Peñasquitos 230-kV Transmission Line and New Sycamore – Mission 230-kV Transmission Line has been eliminated from full consideration in the EIR.

4.7.3 Alternative 32: Loop-in of a Single Mission – San Luis Rey 230-kV Transmission Line into Peñasquitos Substation (CPUC)

4.7.3.1 Description

Alternative 32 would construct two new 230-kV transmission lines from Peñasquitos Junction to Peñasquitos Substation. One 230-kV transmission line would provide power from San Luis Rey Substation to Peñasquitos Substation and the second would provide power from Mission Substation to Peñasquitos Substation. This alternative would require segmenting one of the Mission – San Luis Rey transmission lines to bring 230-kV power into and out of Peñasquitos Substation.

From the area of Peñasquitos Junction, new 69 kV double-circuit TSPs would be installed west of Peñasquitos Junction to the area of Proposed Project Pole 48. For this section from Peñasquitos Junction to Pole 48 the existing 69 kV wood H-frames would be removed and the new 69 kV double-circuit TSP would be located 130 feet, generally south, of the existing lattice steel tower (LST) in this corridor. In the area of P48, two new 69 kV cable-poles would be installed to transition the two 69 kV circuits underground. The two new 69 kV circuits would continue underground within Carmel Mountain Road to Peñasquitos substation. The above construction allows for the existing 69 kV circuits on the wood H-frame and on the LST to be transferred to the 69 kV double-circuit TSP and underground ductbank.

From Peñasquitos Junction to Peñasquitos Substation new 138 kV TSPs would be installed. The existing circuit TL13804 would be transferred from the existing LST to the new 138 kV TSP. The new 138 kV TSP could be configured as either a single-circuit TSP or a double-circuit TSP, with open positions for a "future or spare" 138 kV circuit. Due to their higher voltage, the 138 kV TSP would need to be taller than a 69 kV TSP but shorter than would be necessary for a 230 kV TSP. From Peñasquitos Junction to Peñasquitos Substation the new 138 kV TSP would be located

65 feet, generally south, of the existing LST in this corridor. From P48 to Peñasquitos Substation the existing 69 kV wood H-frames would be removed.

From Peñasquitos Junction to Peñasquitos Substation, the looped TL 23001 would be placed on both sides of the existing 230 kV LST. On the south side of the LST, TL 23001 would be a circuit from Mission Substation to Peñasquitos Substation and on the north side of the LST, TL 23001 would be a circuit from Peñasquitos Substation to San Luis Rey Substation.

4.7.3.2 Consideration of CEQA Criteria

Project Objectives
A single loop-in of a Mission – San Luis Rey 230-kV transmission line does not meet any of the objectives of the Proposed Project. The ability for the alternative to meet basic project objectives was evaluated by the CPUC (refer to Attachment A). The results of the CPUC's analysis show that the alternative is similar to the existing conditions without the Proposed Project and that the alternative does not achieve any of the basic project objectives. SDG&E would like require upgrades to the Sycamore-Scripps and Poway-Pomerado lines to address thermal overload on those lines; however the alternative would still fail to meet most objectives even with the line upgrades.

Technical, Legal, Regulatory, and Environmental Feasibility
The technical, legal, regulatory, and environmental feasibility of this alternative have not been considered further because the alternative does not meet any of the basic project objectives.

4.7.3.3 Conclusions

ELIMINATED. This alternative does not meet any of the basic project objectives; therefore, the alternative has been eliminated from full consideration in the EIR.

4.7.4 Alternative 33: Loop-in of Both Mission – San Luis Rey 230-kV Lines into Peñasquitos Substation (CPUC)

4.7.4.1 Description

Alternative 33 involves construction of four 230-kV transmission lines (twelve wires total) between Peñasquitos Junction and Peñasquitos Substation. TL 23001 and TL 23004 would be segmented at Peñasquitos Junction using a dead-end structure and both transmission lines would be brought into and out of Peñasquitos Junction. The alternative would require removal of an existing wood H-Frame line supporting the existing 69kV line and installation of a set of new 138-kV TSPs in Segment D (approximately 2.8 miles). The construction of Alternative 33 would be the same as Alternative 32; however both TL 23001 and 23004 would be installed on the existing steel lattice tower. The south side of the LST would carry the two 230-kV transmission lines originating at Mission Substation from Peñasquitos Junction to Peñasquitos Substation and the north side of the LST would carry the two 230-kV transmission lines originating at San Luis Rey Substation from Peñasquitos Junction to Peñasquitos Substation.

4.7.4.2 Consideration of CEQA Criteria

Project Objectives
The loop-in of both Mission – San Luis Rey 230-kV transmission lines does not meet any of the basic project objectives. The ability for the alternative to meet basic project objectives was evaluated by the CPUC (refer to Attachment A). The results of the CPUC's analysis show that the alternative is similar to the existing conditions without the Proposed Project and the alternative does not achieve any of the basic project objectives. SDG&E would likely need to upgrade the Sycamore-Scripps and Poway-Pomerado lines to address thermal overloads; however the alternative would still fail to meet most objectives even with the line upgrades.

Technical, Legal, Regulatory, and Environmental Feasibility
The technical, legal, regulatory, and environmental feasibility of this alternative have not been considered further because the alternative does not meet any of the basic project objectives.

4.7.4.3 Conclusions

ELIMINATED. This alternative does not meet any of the basic project objectives; therefore, the alternative has been eliminated from full consideration in the EIR.

4.7.5 Alternative 34: New Sycamore – Mission 230-kV Transmission Line and Loop-in of One Mission – San Luis Rey 230-kV Line into Peñasquitos Substation (CPUC)

4.7.5.1 Description

This alternative involves constructing a new 230-kV transmission line between Sycamore Canyon and Mission Substations and loop-in of a Mission – San Luis Rey transmission line to Peñasquitos Substation. The Sycamore – Mission segment of the alternative would be constructed as described in Alternative 31, above. This alternative differs from Alternative 31 in that it does not add a new transmission line between Mission and Peñasquitos Substations, instead the alternative would loop-in an existing transmission line between Peñasquitos Junction and Peñasquitos Substation. The loop-in would be constructed in the same manner as described in Alternative 32 above.

4.7.5.2 Consideration of CEQA Criteria

Project Objectives
The combined Sycamore – Mission transmission line and loop-in of a Mission – San Luis Rey transmission lines meet all basic project objectives. The ability for the alternative to meet project objectives was evaluated by the CPUC (refer to Attachment A). The alternative would improve grid reliability, deliverability of renewable energy, and efficiently deliver energy to the load center by adding additional capacity on a higher voltage line between Sycamore Canyon and Peñasquitos Substations via Mission Substation. This alternative is electrically comparable to the Proposed Project.

4.7.5.3 Technical, Legal, and Regulatory Feasibility

The transmission line is potentially feasible, but requires reconstructing a number of lines and replacing a number of existing structures in the Sycamore – Mission Segment to construct the transmission line within SDG&E's existing easement from MCAS Miramar and within existing SDG&E ROW. The alternative would meet regulatory and legal feasibility criteria with the structure replacements because the alternative would not require new easement from MCAS Miramar. The loop-in could be constructed within SDG&E ROW in Los Peñasquitos Canyon, but would require replacement of the existing wood H-Frames with taller 138-kV tubular steel poles.

4.7.5.4 Potentially Reduced Environmental Impacts

- **Traffic** – This alternative would avoid underground construction and temporary lane closures on Carmel Valley Road
- **Aesthetics** – Avoids new TSPs and overhead transmission construction in Segment A of the Proposed Project
- **Recreation** – Eliminates construction and new structures in Sycamore Canyon Park and Black Mountain Ranch Community Park

4.7.5.5 Potentially Increased Environmental Impacts

- **Air Quality and Greenhouse Gases** – The additional construction activity due to shoo-flies and steel structure removals and replacements in the Sycamore-Mission segment would require greater total construction equipment hours for additional structure installation/removal and conductor stringing, which would likely result in greater overall emissions of criteria pollutants and greenhouse gases. The increased air quality emissions could result in more severe (i.e., more significant) effects as any increase in the amount of equipment operating simultaneously would increase the maximum daily emissions of criteria pollutants, thereby increasing the severity of the effects.
- **Aesthetics** – The alternative would increase the number and height of poles by rebuilding existing structures and adding new TSPs in the Mission-Sycamore Segment and would increase the height of the proposed poles in Segment D due to the installation of taller 138-kV TSPs rather than 69-kV TSPs in the Proposed Project.
- **Land Use** – The alternative would install two 230-kV lines in proximity to homes in Segment D, which could cause land use compatibility conflicts.
- **Biological Resources** – The alternative would require additional temporary and permanent impact areas, including temporary structure work areas, permanent structure maintenance pads, and temporary stringing sites. These increased impact areas would result in greater impacts to biological resources compared to the Proposed Project. Impacts to sensitive vegetation communities would increase proportionately with the length of the proposed route in habitat areas. The alternative would require new structures in Mission Trails Open Space Preserve and mapped habitat for Quino checkerspot butterfly (Ebbin Moser and Skaggs 2007) and critical habitat for San Diego fairy shrimp (USFWS 2015). The new 230-kV

TSPs in Los Peñasquitos Canyon may result in additional biological impacts to Los Peñasquitos Canyon Preserve.

- **Cultural and Paleontological Resources** – The alternative would result in a larger impact area due to the additional pole installation and removals when compared to the Proposed Project. Therefore, the potential for impacts to cultural, historical, and paleontological resources would increase in general proportion to the increase in impact area.
- **Recreation** – The alternative would increase construction in recreational areas, specifically Mission Trails Regional Park.
- **Noise** – Noise impacts would increase due to the longer construction timeframe with potential increased use of helicopters due to steep terrain. Corona noise may be slightly greater in Segment D due to the installation of two 230-kV lines instead of one for the Proposed Project.
- **Hydrology and Geology**– The alternative requires more surface disturbance due to increased pole removals and new pole installations, particularly on steep slopes. The potential for erosion and sedimentation and number of retaining walls would increase proportional to the area of disturbance and construction in areas of steep slopes.
- **Traffic** – Involves lane closures and impacts to traffic on Carmel Mountain Road during construction of the underground 69-kV lines.

4.7.5.6 Conclusions

ELIMINATED. This alternative would meet all of the project objectives and is potentially feasible; however, it would result in greater overall environmental impacts than the Proposed Project because it would require more new poles and structures. It would intensify visual impacts in Segment D by requiring larger TSPs than the Proposed Project. Therefore, the New Sycamore – Mission 230-kV Transmission Line and loop-in of a Mission – San Luis Rey line has been eliminated from full consideration in the EIR.

4.7.6 Alternative 35: New Mission – Peñasquitos 230-kV Line and Reconfigured and Reconductored Power Lines (ORA)

4.7.6.1 Description

On May 7, 2014, the Office of Ratepayer Advocates (ORA) filed a protest to the SDG&E Application to construct the Sycamore-Peñasquitos project. On December 12, 2014 Christopher Myers and William Stephenson provided testimony for an alternative to the proposed project made by the ORA. ORA proposed the Mission – Peñasquitos 230-kV Line project as an alternative for the Proposed Project.

The ORA alternative would construct a new 230-kV line from Peñasquitos Junction to Peñasquitos Substation and would include the following three components:

- Part 1 - Mission – Peñasquitos 230-kV line—Construct Segment D, new 230-kV conductor on existing double-circuit 230-kV steel lattice tower between Peñasquitos Junction and Peñasquitos Substation

- Part 2 - Reconfigure the 69-kV transmission lines near the Miramar Substation
- Part 3 - Reconductor the Poway-Pomerado 69-kV transmission line

On January 30, 2015 Willie Thomas, John Jontry, and Huang Lin (of SDG&E) provided rebuttal testimony regarding the ORA alternative. SDG&E makes the following points:

- A proper load flow analysis that evaluates all of Category B and C contingencies reveals that ORA's alternative fails to mitigate all of the NERC Category B violations eliminated by the Proposed Project and causes other Category B violations
- ORA's alternative would unacceptably reduce reliability at a substation serving an important national security installation
- ORA's alternative would cause additional NERC violations requiring additional mitigations and fail to mitigate other overloads solved by SDG&E's Proposed Project
- ORA's alternative would not address overloads on the 230-kV systems
- ORA alternative would be a short-term solution
- ORA alternative may be more expensive than stated because of additional needed mitigation

ORA subsequently modified the alternative as described in Alternative 36, below.

4.7.6.2 Consideration of CEQA Criteria

Project Objectives
The alternative does not meet the objective of delivering energy more efficiently to the load center in San Diego or improving deliverability of renewable energy in SDG&E's RPS portfolio. Therefore, this alternative does not meet most project objectives (SDG&E 2015).

Technical, Legal, Regulatory, and Environmental Feasibility
The technical, legal, regulatory, and environmental feasibility of this alternative are not considered further because the alternative does not meet the basic project objectives.

4.7.6.3 Conclusions

ELIMINATED. This alternative is not considered further because it was modified by ORA as shown in Alternative 36 below. This alternative is therefore superseded by Alternative 36, below.

4.7.7 Alternative 36: New Mission – Peñasquitos 230-kV Reconductored Poway-Pomerado Line and Series Reactor (ORA)

4.7.7.1 Description

The modified ORA alternative would construct a new 230-kV line from Peñasquitos Junction to Peñasquitos Substation and include the following components:

- Part 1 - Mission – Peñasquitos 230-kV line—Construct Segment D, new 230-kV conductor on existing double-circuit 230-kV steel lattice tower between Peñasquitos Junction and Peñasquitos Substation
- Part 2 - Reconductor the Poway – Pomerado 69-kV transmission line
- Part 3 - Add a new series reactor within either the Scripps or Miramar Substation. The series reactor would relieve loadings on the Sycamore to Scripps 69-kV line (Sycamore – Scripps Line). Series reactors shunt the power to other lines and require a combustion turbine like the Sycamore-Peñasquitos line

4.7.7.2 Consideration of CEQA Criteria

Project Objectives

The ability for this alternative to meet basic project objectives was evaluated by the CPUC (refer to Attachment A). The alternative would alleviate thermal overloads on two 69-kV lines; Sycamore – Scripps and Poway – Pomerado 69-kV lines; however, overloads on one Mission – Miguel transmission line and other transmission lines would remain, including a second Mission – Miguel line, Eco – Imperial Valley line, and Miguel – Eco line, which would all be loaded above 99 percent of their emergency rating. These circuits would therefore require mitigation if this alternative were to be selected. In addition, there are several 230-kV and 69-kV circuits along these power lines that are loaded above 95 percent, which would likely require mitigation within 3 to 5 years after 2024. This alternative does not achieve two out of three project objectives because it does not deliver energy more efficiently than the Proposed Project, or deliver renewable energy to meet SDG&E's RPS goals. The alternative also involves a number of electrical upgrades that would not achieve the objective of delivering energy more efficiently to the load center in San Diego.

Technical, Legal, Regulatory, and Environmental Feasibility

The technical, legal, regulatory, and environmental feasibility of this alternative are not considered further because the alternative does not meet most of the basic project objectives.

4.7.7.3 Conclusions

ELIMINATED. This alternative does not meet most of the basic project objectives; therefore, the alternative has been eliminated from full consideration in the EIR.

4.7.8 Alternative 37: Imperial Irrigation District Hoober to SONGS Line (CPUC)

4.7.8.1 Description

Alternative 37 involves construction of a new transmission line from Imperial Irrigation District (IID) to SONGS. The new transmission line would provide another source of renewable energy into SDG&E territory. IID has submitted requests for the Hoober to SONGS line to the CAISO as part of the Transmission Planning Process and Hoober to SONGS project has not been approved.

4.7.8.2 Consideration of CEQA Criteria

Project Objectives
The Hoober to SONGS line has not been approved by CAISO and is not included in the 2014/15 transmission plan. The alternative is therefore considered speculative and load flow testing was therefore not conducted on the alternative.

Technical, Legal, Regulatory, and Environmental Feasibility
The alternative would require substantial construction to provide a new line to connect Hoober to SONGS at a distance of over 100 miles. There would likely be legal and regulatory hurdles to constructing the new line and obtaining potentially new ROW for the transmission line. Because of the long distance of the line and because the alternative has not been approved by CAISO, it is not considered a feasible alternative to the Proposed Project because it is speculative. The environmental feasibility of this alternative was therefore not evaluated.

4.7.8.3 Conclusions
ELIMINATED. This alternative is speculative and would likely result in greater environmental impacts than the Proposed Project due to the distance required to construct a new line from Imperial Valley to SONGS (over 100 miles). The alternative would likely encounter other feasibility hurdles because it would involve construction of a much longer transmission line than the Proposed Project, which would likely require additional ROW. Therefore, this alternative was eliminated from full consideration in the EIR.

4.8 NON-WIRES ALTERNATIVES ELIMINATED

4.8.1 Alternative 38: Increased Generation at Carlsbad or Encina During Peak Loads (CPUC)

4.8.1.1 Description
This alternative includes increased generation of non-renewable power at Carlsbad and/or Encina electric generating facilities. The CPUC recently approved SDG&E's authority to enter into a tolling agreement with Carlsbad Energy Center. The CPUC decision reduces the contract capacity from 600 MW to 500 MW and requires that the 100 MW in residual procurement authority consist of preferred resources or energy storage (CPUC 2015). The Carlsbad Energy Center represents a replacement of the Once-Through-Cooling (OTC) energy facilities scheduled for retirement at Encina; therefore, it does not directly represent additional energy resources beyond the existing Encina energy facility. The alternative could provide additional energy generation during peak loading to supply additional power into Peñasquitos Substation from the north.

4.8.1.2 Consideration of CEQA Criteria

Project Objectives
This alternative does not achieve any of the project objectives. It would not deliver energy more efficiently because it would require additional energy generation. It would also not support

delivery of renewable energy because the Carlsbad Energy Center is a gas-fired power plant which would not improve the delivery of renewable energy from the Sunrise Powerlink corridor. The alternative also exacerbates some reliability issues by increasing loading on lines that are already overloaded.

Technical, Legal, Regulatory, and Environmental Feasibility
The technical, legal, regulatory, and environmental feasibility of this alternative are not considered further because the alternative does not meet any of the basic project objectives.

4.8.1.3 Conclusions
ELIMINATED. This alternative does not meet any of the basic project objectives; therefore, the alternative has been eliminated from full consideration in the EIR.

4.8.2 Alternative 39: In-Area Distributed Generation of Renewables (Public Scoping; Public Utilities Code Section 1002.3)

4.8.2.1 Description
This alternative would involve deployment of distributed of many small (less than 20 MW) renewable energy projects within the Cities of San Diego and Poway. The Proposed Project would provide over 400 MW of additional energy; therefore this alternative would require more than 20 separate renewable energy projects to provide the level of energy generation comparable to the Proposed Project. Distributed generation is electricity production that is on-site or close to the load center that it is intended to serve. Distributed renewables refer to the use of renewable energy resources in distributed energy generation. The generating capacity of a distributed generation source is significantly smaller than those of centrally located utility-scale energy generation and can range from generation at a single residence to larger installations for commercial or multi-unit housing applications. Distributed generation is generally limited to systems less than 20 MW and could be interconnected at 16-kV distribution or sub-transmission voltages (CEC 2007).

Examples of distributed renewable generation include small-scale photovoltaic, wind, biomass, and combined cooling and/or heat and power (also known as cogeneration) systems that use renewable-based fuels, as well as fuel cells produced from renewable energy resources. Distributed renewable generation does not include utility-scale photovoltaic, solar thermal, biomass, or wind energy power stations, or hydroelectric, geothermal, and non-combined heat and power-related waste-to energy systems (including digester gas, landfill gas, and municipal solid waste) as load is typically not close to generation and onsite load is negligible. Agreements such as power purchasing agreements (PPA) may be required for distributed renewables that would support existing agricultural, industrial, or commercial businesses. The businesses would likely be connected to the local power grid; however, agreements would be required to sell electricity to the utility. This approval is in addition to necessary easements or authorizations from property owners.

California Senate Bill (SB) X1-2, signed by Governor Brown in April 2011, codifies California's renewable energy goals at 33 percent by 2020. This law requires all California electricity providers to increase their procurement of eligible renewable resources to at least 33 percent by 2020, and contains interim targets of 20 percent by 2013 and 25 percent by 2016. The Renewable Portfolio Standard (RPS) Program was originally mandated in 2002 by SB 1078 (Sher, Chapter 516, Statutes of 2002) under Public Utilities Code §381, 383.5, 399.11 through 399.15, and 445.

The CPUC, in collaboration with CEC, is addressing its responsibilities in implementing the RPS through its own proceedings. On April 22, 2004, CPUC issued an Order Instituting Rulemaking to specifically address the RPS (R.04-04-026). CEC and CPUC approved an Energy Action Plan in 2003, which was finalized in 2005. The Energy Action Plan includes specific measures for building sufficient new generation, accelerating the state's goal for renewable resource generation, and promoting customer- and utility-owned distributed generation.

In January 2006, the CPUC created the CSI (CPUC ruling R.04-03-017). The initiative moved the consumer renewable energy rebate program for distributed photovoltaic systems serving existing homes and buildings from CEC to the utility companies under the direction of the CPUC. The CPUC also oversees the Self-Generation Incentive Program, which supports existing, new, and emerging distributed energy systems other than photovoltaic installed on homes and buildings, including small-scale wind and fuel cells.

The CEC manages the New Solar Homes Partnership, which was launched in January 2007 and focuses on distributed photovoltaic systems targeted for new residential building construction. CEC released the Distributed Generation and Cogeneration Policy Roadmap for California in March 2007 (CEC 2007). The report included a vision for Distributed Generation and Cogeneration of being significant components of California's electrical system, meeting over 25 percent of the total peak demand. To achieve its vision, California will support incentives in the near term, transition to new market mechanisms, and reduce remaining institutional barriers.

The California Attorney General's office released the "Clean Energy Jobs Plan" in 2010 that provides possible mechanisms to create 12,000 MW of localized energy generation in California. The Clean Energy Jobs Plan calls for California to develop 12,000 MW of localized energy by year 2020. The Plan describes localized energy as onsite or small energy systems located close to where energy is consumed that can be constructed quickly (without new transmission lines) and typically with low environmental impact. The plan also encourages development of energy storage in combination with renewable generation to address intermittency of renewable generation.

4.8.2.2 Consideration of CEQA Criteria

Project Objectives

In-area distributed generation of renewables would not meet any of the project objectives. Small-scale distributed renewable energy generation is already factored into the CAISO base on which the Proposed Project is evaluated. Even with this renewable energy generation, CAISO determined additional electricity would be needed. The CPUC tested the level of renewable generation in the base case and it was determined that additional generation of in-basin renewable energy at the level needed to meet the reliability and RPS goals of the Proposed Project would be infeasible. Distributed generation of renewable energy would not produce adequate electricity to improve grid reliability in the absence of SONGS. While the alternative would increase the generation of renewable resources it would not increase the deliverability of renewable energy to meet SDG&E's RPS goals and avoid thermal overloads.

Technical, Legal, and Regulatory Feasibility

Distributed generation of renewable energy is potentially technically feasible in that the technology exists. The alternative also potentially meets legal and regulatory feasibility and is encouraged by the State of California.

Environmental Feasibility

Environmental Advantages

Distributed generation of renewable energy would avoid all environmental impacts of the Proposed Project by avoiding construction of a new transmission line and substation upgrades.

Environmental Disadvantages

Distributed renewables typically involve small projects; therefore, potential impacts from these projects would not be significant. Implementation of renewable energy projects at the residential scale (particularly rooftop solar, which can be deployed quickly in multiple locations) can exceed the capacity of a local power grid or utility. This excess load can cause delays in bringing new distributed renewable generation to the local electric power grid, require system upgrades, and have other consequences on local circuits.

4.8.2.3 Conclusions

ELIMINATED. Small-scale distributed renewable generation, such as rooftop solar panels, has the potential to appreciably reduce demand on the electrical system; however, the distributed renewable energy generation industry is still a nascent industry. There are numerous institutional, industry, and market barriers that have impeded the growth and adoption of the industry to date. Although the potential is recognized, distributed generation is not currently a significant energy source to meet electricity demands in the area. As of 2013, distributed generation penetration is below 10 percent of total peak demand in California (CPUC 2013). A Distributed Renewable Generation Alternative would involve deployment of small-scale renewable energy projects within the City of San Diego that is much more aggressive than anticipated by CAISO and SDG&E.

Because the potential for, and timing of, distributed renewable generation within the City of San Diego is uncertain and will not achieve any of the objectives of the Proposed Project, Alternative 39 is not carried forward for full EIR analysis.

4.8.3 Alternative 40: Energy Efficiency and Conservation (Public Utilities Code Section 1002.3)

4.8.3.1 Description

Alternative 40 would implement programs to increase energy efficiency and conservation to reduce system loading and demand for power. Energy efficiency is using less energy to perform the same service or task. Energy conservation is the act of reducing or going without a service or task in order to save energy. For example, turning off a light is energy conservation; replacing an incandescent light bulb with a different type of light bulb that uses less energy to produce the same amount of light is energy efficiency. Both conservation and efficiency can reduce the amount of energy used.

Energy efficiency and conservation programs are designed to reduce customer energy consumptions. CPUC regulatory requirements dictate that supply-side and demand-side resource options should be considered on an equal basis in a utility's plan to acquire lowest cost resources. These programs are designed to either reduce the overall use of energy or to shift the consumption of energy to off-peak times. Programs can include the installation of high-efficiency appliances (e.g., efficient heating and cooling systems and energy efficient lighting), the installation of insulation and weatherization, and customer behavior changes (e.g., customers that turn off lights more frequently because of increased customer awareness of their electrical usage).

In November 2012, the CPUC approved a two-year "bridge" budget for 2013-2014 energy efficiency programs (including residential and low income programs), as it prepared to synchronize and combine the funding cycles for energy efficiency and demand response programs starting in 2015 (DOE 2013). These programs are administered by the state's four investor-owned utilities as well as two newly formed regional energy networks (one in northern and one in southern California). Demand response programs administered by SDG&E include the Summer Saver Program and the commercial-customer Technical Assistance and Technology Incentives Program, which are designed to reduce peak electrical demand. The Summer Saver Program provides a credit on participants' summer season electric bills in return for allowing SDG&E to cycle air conditioners when needed during the months of May to September. The commercial-customer program applies to any commercial, industrial, or agricultural customer with a monthly on-peak demand of 20-kilowatts or greater and provides financial incentives to offset the costs of fully-automated demand response measures.

SDG&E also continues to deploy smart meters to existing customers and installs them on all newly constructed facilities as part of their normal business practice. Smart meters record hourly electricity consumption and allow customers to reduce their demand for higher-priced energy during peak periods. Smart meters also allow customers to participate in SDG&E's Summer Saver Program.

The CPUC adopted California's first Long Term Energy Efficiency Strategic Plan in September 2008, which presented a roadmap to achieve maximum energy savings in California. Updated in January 2011, the plan includes a comprehensive framework of energy savings goals and strategies through 2020 and holds energy efficiency to its role as the highest priority resource in meeting California's energy needs.

On March 8, 2003, the California Energy Commission (CEC) and CPUC approved an Energy Action Plan. On September 21, 2005, the Energy Action Plan II was finalized. The shared goal of the Energy Action Plan is to:

> *Ensure that adequate, reliable, and reasonably-priced electrical power and natural gas supplies, including prudent reserves, are achieved and provided through policies, strategies, and actions that are cost-effective and environmentally sound for California's consumers and taxpayers.*

The energy agencies intend to achieve this shared goal through specific means, including meeting California's energy growth needs while optimizing energy conservation and resource efficiency and reducing per capita electricity demand. In 2004, California enacted an energy efficiency resource standard (also called an energy efficiency portfolio standard) for electricity. Energy savings goals for the electricity sector were set for both total retail sales and peak demand. The goals consist of separate electricity savings and demand reduction requirements for each of the three investor-owned electrical utilities.

California issued new building standards in July 2008, which mandated that all new construction reduce energy use by 15 percent, water use by 20 percent, and water for landscaping by 50 percent starting in 2010. In April 2008, the CEC approved dozens of changes to the state's building energy efficiency standards for new construction, commonly known as Title 24. In October 2007, the CPUC adopted a target that all homes built in California after 2020 be energy neutral and that all commercial buildings be energy neutral by 2030. Electric ratepayers also receive incentives for installing energy efficient solar hot water systems under the CPUC's California Solar Initiative (CSI) – Thermal Program.

The California Attorney General's office released the "Clean Energy Jobs Plan" in 2010, which proposed an action plan to develop renewable energy and energy efficiency technologies. The plan includes specific elements for developing more combined heat and power projects, making existing buildings more energy efficient, and stronger efficiency standards for new appliances and buildings.

4.8.3.2 Consideration of CEQA Criteria

Project Objectives

Energy efficiency and conservation would not meet any of the project objectives. Energy efficiency and conservation programs are already factored into the CAISO base case on which the Proposed Project is evaluated. Even with the energy efficiency and conservation programs,

CAISO determined the Proposed Project was needed. The alternative is not feasible at a scale that would meet the reliability and policy objectives of the Proposed Project.

Technical, Legal, and Regulatory Feasibility
Energy efficiency and conservation programs are existing programs. They are potentially feasible from a technical, legal, and regulatory perspective.

Environmental Feasibility
Environmental Advantages
Energy efficiency and conservation would avoid all environmental impacts of the Proposed Project by avoiding construction of a new transmission line and substation upgrades.

Environmental Disadvantages
There are no environmental disadvantages to energy efficiency and conservation. The State of California supports these programs due to the lack of environmental impacts.

4.8.3.3 Conclusions
ELIMINATED. Energy efficiency and conservation programs cannot be implemented at a scale that would achieve any of the project objectives. Additional energy efficiency beyond that occurring in the CAISO base case may be technically possible, but it is speculative to assume such a level of energy efficiency is achievable The alternative is therefore eliminated from full evaluation in the EIR.

4.8.4 Alternative 41: Demand Response (Public Utilities Code Section 1002.3)
4.8.4.1 Description
Demand response is end-use electric customers reducing their electricity usage in a given time period, or shifting that usage to another time period, in response to a price signal, a financial incentive, an environmental condition or a reliability signal. Demand response is among the Commission's top energy priorities because it provides numerous economic and environmental benefits for California ratepayers.

Demand response enables utilities to avoid building new power plants that are used only during the peak hours of the day (typically late afternoon to early evening). Building and operating plants that are used only on occasion (also known as "peaker plants") is expensive, and those costs are eventually passed on to utility ratepayers. Demand response also enables utilities to avoid purchasing high-priced wholesale energy by reducing the demand for that energy at particular times of the day. Wholesale energy costs are eventually passed on to ratepayers. To the extent that those costs can be lowered by demand response, ratepayers benefit. Demand response also provides system and local reliability benefits in that they enable utilities to avoid the use of rolling blackouts when there is not enough generation to satisfy demand. Finally demand response provides environmental benefits by enabling the utilities to avoid the use of peaker plants. Peaker plants typically have higher greenhouse gas and other air emissions. Demand response also has the potential to integrate more renewable energy (wind, solar, etc.) into the grid.

4.8.4.2 Consideration of CEQA Criteria

Project Objectives

This alternative does not meet most two out of three basic project objectives. Demand response would not improve deliverability of renewable energy in SDG&E's RPS portfolio, nor would demand response provide energy more efficiently to the load center in San Diego. Demand response could improve grid reliability by decreasing peak demand and therefore decreasing peak loading. Demand response is already factored in the CAISO base cases and is not adequate to offset the need for the Proposed Project.

Technical, Legal, and Regulatory Feasibility

SDG&E has a current demand response program that is approved by the CPUC. The alternative potentially meets technical, legal, and regulatory feasibility requirements because it is part of an on-going program.

Environmental Feasibility

Environmental Advantages

The alternative avoids all impacts of the Proposed Project by avoiding construction of new electrical infrastructure.

Environmental Disadvantages

There are no environmental disadvantages of demand response programs. The CPUC requires investor-owned utilities to have demand response programs because they provides economic and environmental benefits.

4.8.4.3 Conclusions

ELIMINATED. The demand response alternative does not meet most project objectives because it would not improve the deliverability of renewable energy and would not deliver energy more efficiently to the load center. Therefore, this alternative is eliminated from full analysis in the EIR.

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ATTACHMENT A

APPENDIX D
ALTERNATIVES SCREENING REPORT

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ZGLOBAL
Power Engineering & Energy Solutions

"An innovative power engineering consulting firm staffed by industry-leading experts"

Sycamore-Peñasquitos 230 Kilovolt Transmission Line

CPCN Application - A.14-04-011

Project Alternatives Assessment
A Power Flow Analysis

For
Panorama Environmental, Inc.

By
ZGlobal, Inc.

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Final
July 31, 2015

Table of Contents

Sycamore-Peñasquitos 230 Kilovolt Transmission Line
Alternative Transmission Assessment

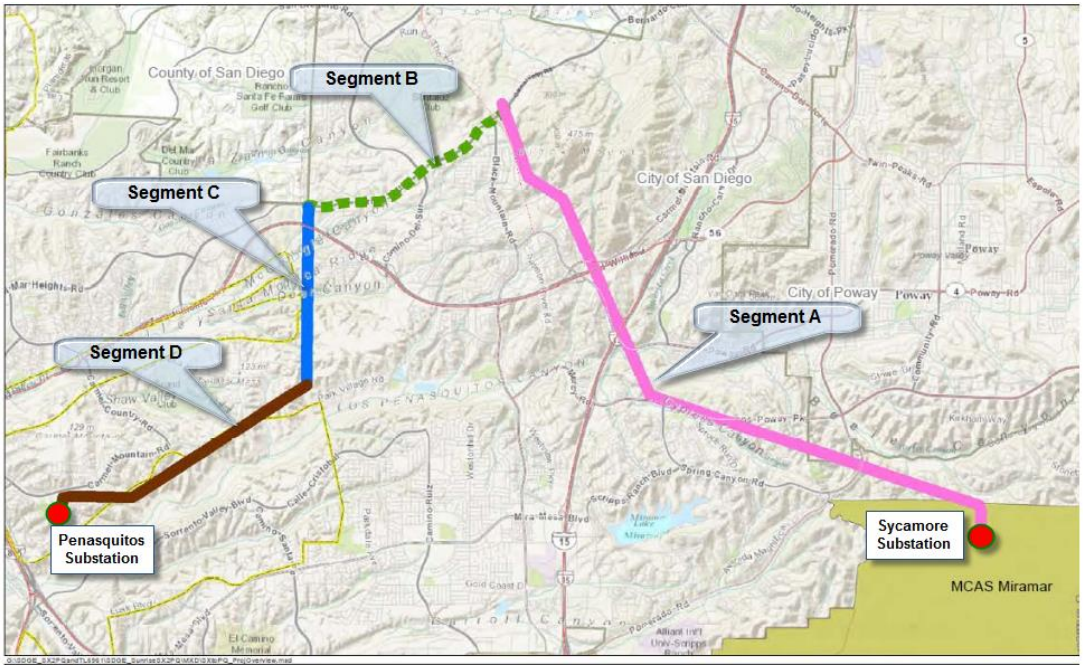
Panorama Environmental, Inc. (Panorama) engaged ZGlobal Engineering and Energy Solutions (ZGlobal) to conduct an independent review of San Diego Electric and Gas' (SDG&E) Sycamore-Peñasquitos 230 Kilovolt Transmission Line Project (Project) which is currently going through a CEQA process (Application A.14-04-011) by the CPUC. ZGlobal's key assignment was to conduct the following:

a. Review the project application, PEA, official data requests and subsequent responses, and conduct an independent evaluation of the project needs and objectives
b. Identify potential alternatives
c. Conduct a power flow analysis to assess the feasibility of potential alternatives

Proposed Project Definition

Briefly, the Proposed Project includes construction and operation of a new approximately 16.7 mile 230 kV transmission line between the existing Sycamore Canyon and Peñasquitos Substations[1]. The Project includes four transmission line segments (A – D) and minor modifications to four existing substations, identified as:

1) **Segment A**: Sycamore Canyon Substation to Carmel Valley Road.
2) **Segment B**: Underground Carmel Valley Road
3) **Segment C**: Carmel Valley Road to Peñasquitos Junction
4) **Segment D**: Peñasquitos Junction to Peñasquitos Substation
5) Four Substations (Sycamore, Peñasquitos, San Luis Rey and Mission)



[1] http://www.cpuc.ca.gov/Environment/info/panoramaenv/Sycamore_Penasquitos/PDF/PEA_PartA.pdf

Refer to Proponent's Environmental Assessment (PEA) Chapter 3.0 Proposed Project Description for specific detail of the constituent components of the Proposed Project.

Purpose and Need Summary

Key among the objectives of the project are to meet the needs for delivery of renewable energy development in Imperial County and east San Diego County utilizing the Sunrise Powerlink by providing a gateway for delivering the energy to SDG&E's load center supported by the Penasquitos Substation. Currently, energy delivered to the Sycamore Substation via the Sunrise Powerlink - by way of the Suncrest 500/230 kV substation – is delivered to area loads via the existing higher impedance 138 kV and 69 kV transmission infrastructure. This has resulted in congestion and reliability issues with certain of these lines emanating from Sycamore, which from a reliability perspective is one of the drivers triggering the need and purpose of the Proposed Project.

Further, with the SONGS facility shutting down, wherein SDG&E lost the access to over 700 MW of generation to support its load, additional reliability issues ensued (voltage issues and the decrease in local resource capacity). The reduction of generation resources supporting SDG&E load via Path 44 (the five 230 kV lines from SONGS feeding into the San Luis Rey and Talega Substations) need to be made up or replaced. Additionally, the impending retirement of the Once-Through-Cooling (OTC) local resource, the ~ 900 MW Encina generating facility, which directly feeds the Penasquitos Substation, will be retired in 2017 or shortly thereafter. The Proposed Project provides assistance in relieving the loss of these resources by relieving the constraints of energy flow from the gateway substation, Sycamore, much of it being renewable solar energy supporting peak periods, and by providing that energy directly to SDG&E's load center at the Penasquitos Substation.

Refer to SDG&E's filed PEA Part A, Chapter 2 for a descriptive breakdown of the purpose and needs underscoring the Proposed Project.

Transmission System Alternatives

Methodology and Approach

After reviewing the Proposed Project's application material posted on the CPUC website, including CPUC data requests and responses provided by SDG&E, and the California Independent System Operator's (CAISO) 2012/2013 Transmission Plan, ZGlobal sought concurrence from Panorama and the CPUC regarding the Power Flow study base cases and contingency files to be used for conducting analyses of potential alternatives to the Proposed Project. The objective of any viable transmission system alternative is to meet most, if not all, of the stated objectives of the Proposed Project.

To conduct a comparative analysis of any alternative to the Proposed Project, it was determined that the SDG&E/CAISO 2024 Summer Peak Reliability base case (Reliability base case) and associated contingency files would be used as the basis for this comparative study. The Reliability base case was the latest or most up-to-date base case available on the CAISO's secure website. The CAISO used the case as a foundation to prepare its 2014-2015 Transmission Plan. The future generation modeled in this base case represents the level of generation deemed viable and presumed on-line by the CAISO and IOUs in 2024. It is established utilizing a set of weighed

criteria such as power purchase agreements (PPAs), permitting status, executed interconnection agreements, construction status, etc. to screen out speculative generation. Additionally, CAISO approved transmission projects including reliability and network upgrades associated with generators with executed Generator Interconnection Agreements (GIAs) with in-service dates on or before 2024 are included along with appropriate CEC approved load forecasts.

The study or analysis effort begins with the Proposed Project, as it is included in the SDG&E/CAISO 2024 Summer Peak Reliability base case, by verifying or validating the case by running the associated contingency files and determining that no reliability violations exist and assessing the line flows of the regional transmission system with a focus on the Sycamore and Penasquitos substation line flows as these were key elements driving the need and purpose for the Proposed Project (*i.e.* mitigating line overloads and relieving the renewable energy flow from the gateway substation, Sycamore, and providing energy to the focused load center, Penasquitos).

Power Flow Alternatives or Scenarios

A number of alternatives to the Proposed Project were identified within the scope of this analysis. The purpose was to establish a direct comparison of the tested alternative to the performance of the Proposed Project. Below summarizes the base cases of the alternatives evaluated.

Alternative No.	Power flow case	Brief description
ES-0	Proposed Project: using the SDG&E/CAISO 2024 Summer Peak Reliability	Latest posted SDG&E/CAISO Reliability base case jointly developed by SDG&E and the CAISO for Reliability analysis of the CAISO system with the Proposed Project incorporated.
ES-1	**No Project:** removal of the Proposed Project and directly associated upgrades	This study case is derived from the **Alternative ES-0: Proposed Project** base case and effectively removes the Proposed Project (Sycamore-Penasquitos 230 kV line along with the associated upgrades including the configuration of the Mission-SLR 230 kV lines)
ES-2	Consists of **ES-1** + a Mission to Penasquitos 230 kV line	This study case is derived from the **Alternative ES-1: No Project** base case and integrates a Mission-Penasquitos 230 kV line
ES-3	Consists of **ES-1** + CAISO approved Mission-Penasquitos 230 kV Line and New Sycamore-Mission 230 kV line	This study case is derived from the **Alternative ES-1: No Project** base case and integrates a Mission-Penasquitos 230 kV line and a new 230 kV line from Sycamore to Mission in the existing Sycamore-Mission corridor.

ES-4	Consists of **ES-1** + Loop-in of Single Mission-SLR 230 kV Line into Penasquitos Substation	This study case is derived from the **Alternative ES-1: No Project** base case and segments one of the Mission-SLR 230 kV lines at Penasquitos Junction and loops it into the Penasquitos Substation
ES-5	Consists of **ES-1** + Loop-in of both Mission-SLR 230 kV Lines into Penasquitos Substation	This study case is derived from the **Alternative ES-1: No Project** base case and segments two (both) of the Mission-SLR 230 kV lines at Penasquitos Junction and loops them into the Penasquitos Substation
ES-6	Consists of **ES-1** + New Mission to Penasquitos 230 kV line + reconductor the Poway-Pomerado 69 kV line + Series reactor on the Scripps-Miramar 69 kV line	This study case is derived from the **ES-1: No Project** case and adds a new Mission to Penasquitos 230 kV line and reconductors the Poway-Pomerado 69 kV line and adds a series reactor to the Scripps-Miramar 69 kV line as mitigation to the line overloads
ES-7	Consists of **ES-1** + New Sycamore to Mission 230 kV Line + Loop-in of one (1) Mission-SLR 230 kV Line into Penasquitos Substation	Starting with the **ES-1: No Project** alternative, a new Sycamore-Mission230 kV Line plus a loop-in of one (1) Mission-SLR 230 kV Line into Penasquitos Substation. Similar to ES-3, it provides circuiting between Sycamore and Penasquitos

Summary of Analyses

The analyses are summarized in a tabular format accompanied by their associated power flow plots or system diagrams to assist the reader in getting a better picture of how various substations are interconnected and the amount of power flowing on these transmission circuits. This analysis effort utilized only the 2024 SDG&E/CAISO Summer Peak reliability case to establish a performance delta or variance in performance results. Similar efforts could have been conducted with Off-Peak cases, additional or other base case years, deliverability cases and/or generation interconnection (Cluster) base cases. It was decided that this effort would not be necessary. Following a number of the tables in Appendix A are "Power Flow" plots Refer to Appendix C for a complete listing of applicable Power Flow plots.

Alternative ES-0: Proposed Project

The Proposed Project and all constituent and associated upgrades are fully modeled in the SDG&E/CAISO 2024 Summer Peak Reliability base case. This case represents the latest or most up-to-date base case available on the ISO's secure website. It is deemed the most authentic and related base case created by SDG&E and the CAISO with input from CAISO stakeholders as well. The CAISO used this case as a foundation to prepare its 2014-2015 Transmission Plan. Additionally, the future generation modeled in this base case represents the level of generation including RPS penetration level deemed viable and presumed on-line by the CAISO and SDG&E

in 2024. It is established utilizing a set of weighed criteria such as power purchase agreements (PPAs), permitting status, executed interconnection agreements, construction status, etc. to screen out speculative generation. This case also incorporates the approved load forecast level as determined by the CEC. This reference study case provides the basis from which a direct comparison of the proposed alternatives may be studied and compared.

We also note that this study case includes CAISO approved transmission projects through the 2013/2014 transmission planning process including the recently approved Delaney-Colorado River 500 kV transmission line which was approved after the initial CAISO board approved 2013/2014 Transmission Plan.

Following are the results tables and power flow plots that display the worst line conditions (>= 95%) for Category B or N-1 or L-1, G-1 single contingency, and Category C or N-2 and N-1-1 double contingency) as well as the power flow plots for the worst Category B contingencies.

For the Category A, Normal Conditions or No Contingencies (N-0), where all lines, transformers, etc. are in service and generation dispatch is balanced with load, there are no system overloads or other reliability violations such as voltage levels or deviations. Refer to Figure 1 for the associated power flow plot for the Proposed Project under normal conditions. The plot is generated directly from the SDG&E/CAISO 2024 Summer Peak Reliability base case and displays the 230 kV system from Miguel to San Luis Rey and the Sunrise Powerlink and Southwest Powerlink (SWPL) 500 kV system. The Proposed Project is identified in the diagram along with the reconfigured Mission to San Luis Rey 230 kV line(s). For reader assistance we note on the diagram the MW energy flow level, direction and percent of line capacity used. Power flow plots for the alternatives may be directly compared to this base line plot to aid in viewing and understanding the variances in topology and line conditions.

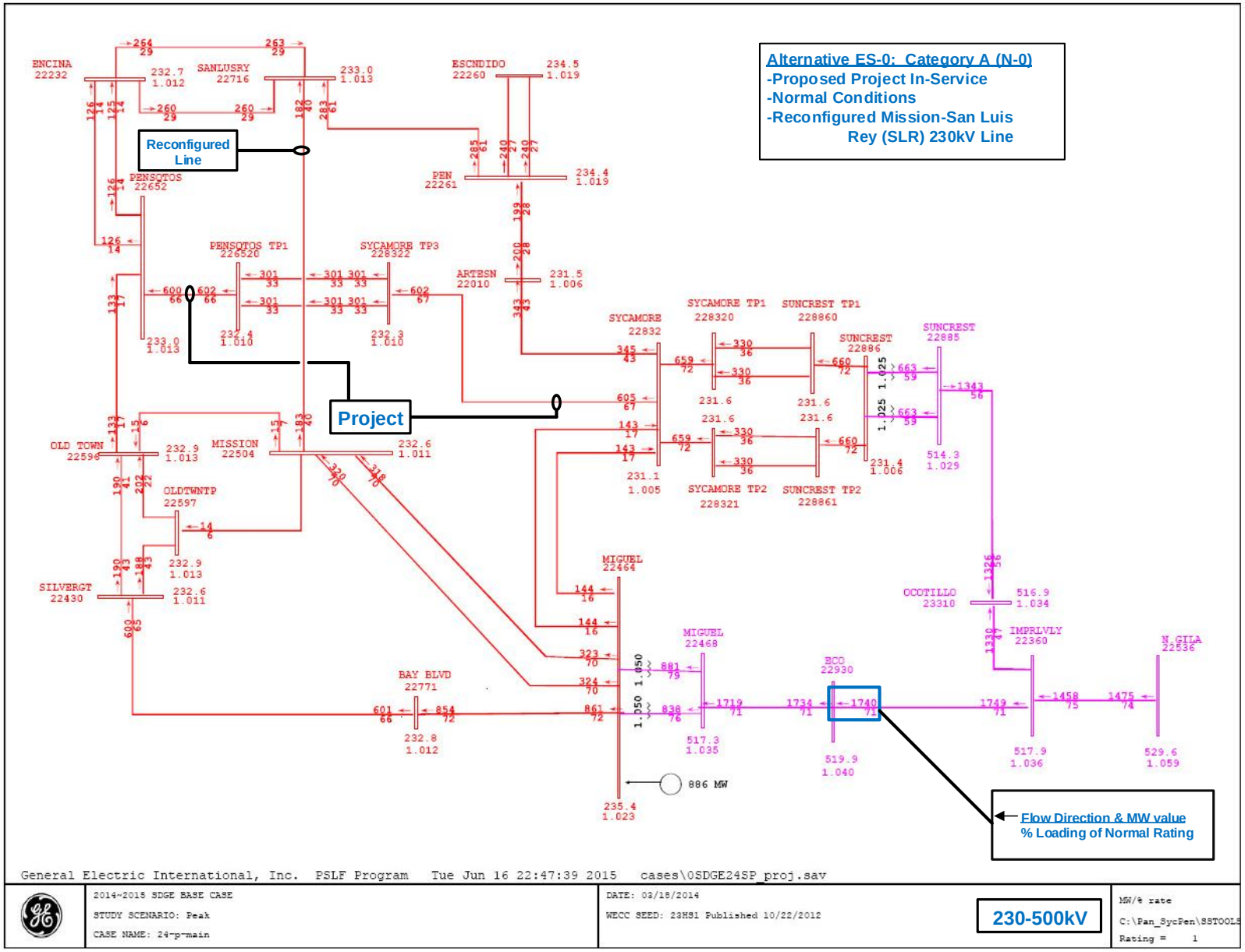


Figure 1 – ES-0, Proposed Project Power Flow Plot under Normal conditions

Following are the tables for **ES-0: Proposed Project** contingency results. The CAISO's outage contingency files for the SDG&E/CAISO 2024 Summer Peak Reliability base case were used. The first table displays the single contingency (N-1) or Category B outages. As with all the tables that follow, the highlighted rows display results where the transmission element (generally a line or transformer) is overloaded. The tables are filtered to display only elements that are at 95% or greater usage of their emergency rating along with the corresponding outage identified.

Alternative ES-0: Proposed Project
SDG&E 2024 Reliability Case
Single Contingency (Category B) Outages
Facilities loaded above 95% of Emergency Rating

Facility								Worst Outage	Loading				Worst Outage Description
From	Name	kV	To	Name	kV	ck	Rated MVA		%	MW	MVAR	AMPS	
22468	MIGUEL	500	22472	MIGUELMP	500	1	1329	T-5073	115.3%	1504	293	1701	22464 MIGUEL 230 22468 MIGUEL 500 2
22464	MIGUEL	230	22472	MIGUELMP	500	1	1329	T-5073	113.4%	-1502	-18	3699	22464 MIGUEL 230 22468 MIGUEL 500 2
22464	MIGUEL	230	22468	MIGUEL	500	2	1344	T-5074	112.6%	-1482	-14	3651	22464 MIGUEL 230 22472 MIGUELMP 500 1
22740	SANYSDRO	69	22616	OTAYLKTP	69	1	50	70035	107.2%	-55	5	447	22076 BORDER 69 22698 SALT CREEK 69 1 + MEF MR1
22604	OTAY	69	22616	OTAYLKTP	69	1	61	SL-1026	104.0%	-56	35	531	22076 BORDER 69 22698 SALT CREEK 69 1
22886	SUNCREST	230	228860	SUNCREST TP1	230	1	1183	SPS1-50285	100.7%	1169	-14	2990	Line ECO-MIGUEL 500kV & Xtrip Only
22886	SUNCREST	230	228861	SUNCREST TP2	230	2	1183	SPS1-50285	100.7%	1169	-14	2990	Line ECO-MIGUEL 500kV & Xtrip Only
228320	SYCAMORE TP1	230	22832	SYCAMORE	230	1	1183	SPS1-50285	100.5%	1163	3	2985	Line ECO-MIGUEL 500kV & Xtrip Only
228321	SYCAMORE TP2	230	22832	SYCAMORE	230	2	1183	SPS1-50285	100.5%	1163	3	2985	Line ECO-MIGUEL 500kV & Xtrip Only
22360	IMPRLVLY	500	22930	ECO	500	1	2598	SPS2-50286	99.5%	2602	366	2983	Line OCOTILLO-SUNCREST 500kV & Xtrip Only
22930	ECO	500	22468	MIGUEL	500	1	2598	SPS2-50286	99.4%	2575	35	2977	Line OCOTILLO-SUNCREST 500kV & Xtrip Only

The table below displays the results of running the N-2, double contingency or Category C outage file.

Alternative ES-0: Proposed Project
SDG&E 2024 Reliability Case
Double Contingency (Category C) outages
Facilities loaded above 95% of Emergency Rating

Facility								Worst Outage	Loading				Worst Outage Description
From	Name	kV	To	Name	kV	ck	Rated MVA		%	MW	MVAR	AMPS	
22306	GARFIELD	69	22208	EL CAJON	69	1	102	Bus_MS69S	119.7%	-122	-21	1022	Mission 69kV S Bus
22356	IMPRLVLY	230	22360	IMPRLVLY	500	2	732	IV-8022	115.4%	828	-13	2076	IV 8022 50002 & BK81 CB
22856	TOREYPNS	69	22200	DUNHILTP	69	1	126	662/6905	115.3%	-149	-21	1215	PQ-TP + PQ-GE
22468	MIGUEL	500	22472	MIGUELMP	500	1	1329	ML-2T	114.3%	1491	288	1684	MIGUEL 230 kV 2T CB
22609	OTAYMESA	230	20149	TJI-230	230	1	796	23041B/42B	113.3%	886	161	2262	OMGP-ML #1+#2 230 kV
22740	SANYSDRO	69	22616	OTAYLKTP	69	1	50	Bus_OY69E	113.2%	-57	10	472	Otay 69kV E Bus
22464	MIGUEL	230	22472	MIGUELMP	500	1	1329	ML-2T	112.4%	-1489	-20	3662	MIGUEL 230 kV 2T CB
22400	LASPULGS	69	22368	JAP MESA	69	1	32	23007OH2/52	109.7%	34	-8	294	SMESA-TA+SMESA-CAP 230
22668	POWAY	69	22664	POMERADO	69	1	155	SX-PQ/23051	108.7%	-170	15	1410	SX-AR + SX-PEN 230 kV
22188	DOUBLTTP	69	22164	DELMARTP	69	1	136	662/6905	108.6%	-152	-24	1236	PQ-TP + PQ-GE
22200	DUNHILTP	69	22188	DOUBLTTP	69	1	136	662/6905	108.6%	-152	-23	1236	PQ-TP + PQ-GE
22644	PENSQTOS	69	22164	DELMARTP	69	1	136	662/6905	108.6%	153	27	1235	PQ-TP + PQ-GE
22420	SILVERGT	69	22868	URBAN	69	1	100	655/699	106.0%	99	47	884	SG-CR + SG-B
22360	IMPRLVLY	500	22911	IV MP	500	1	1329	IV-8022	103.0%	-1339	280	1528	IV 8022 50002 & BK81 CB
22356	IMPRLVLY	230	22911	IV MP	500	1	1329	IV-8022	103.0%	1342	-20	3362	IV 8022 50002 & BK81 CB
22532	MURRAY	69	22306	GARFIELD	69	1	97	Bus_MS69S	100.6%	-97	-15	817	Mission 69kV S Bus
22020	AVOCADO	69	22508	MNSRATTP	69	1	52	Bus_MN69	100.4%	-53	1	437	Monserate 69kV S Bus
22331	MIRASNTO	69	22644	PENSQTOS	69	1	136	662/6905	99.2%	-140	-17	1129	PQ-TP + PQ-GE
22771	BAY BLVD	230	22768	BAY BLVD	69	2	285	BB-1T	99.0%	269	83	700	BAYBLVD 230 kV 1T CB
22440	MELROSE	69	22442	MELRSETP	69	1	102	69XX/69XY	98.0%	-100	-12	836	OR-SA CKT 1&2
22696	ROSE CYN	69	22140	CLARMTTP	69	1	100	Bus_MS69S	97.7%	98	16	817	Mission 69kV S Bus
22504	MISSION	230	22496	MISSION	69	2	285	Bus_MS69S	97.0%	273	46	689	Mission 69kV S Bus
22771	BAY BLVD	230	22464	MIGUEL	230	1	1175	23022/23023	95.8%	-1131	-1	2824	ML-MS 230 kV #1&#2

The Proposed Project's 230/500 kV and 69/138 kV power flow plots for the Category B contingencies is shown in Figures 2 and 3 respectively.

Key Points or Findings:

1. Miguel 500/230 kV transformer is overloaded when the second 500/230 kV transformer bank is out of service. This overload is currently mitigated through an SPS (Special Protection System) to drop generation. This overload is also consistent among all alternatives and the same SPS mitigation applies. Refer to the 230/500 kV power flow plot, Figure 2 which identifies the outage and corresponding overload.
2. Four (4) 230 kV lines, Suncrest-Suncrest Tap, Sycamore-Sycamore Tap, are marginally overloaded under the ECO-Miguel 500 kV single contingency and must be mitigated at some point in upcoming planning cycles.
3. SANYSDRO - OTAY 69 kV line with a tap at OTAYLKTP is overloaded to 107% with an outage of the Border-Salt Creek 69 kV line. This overload will require mitigation at some point in upcoming planning cycles. Refer to the 69/138 kV power flow plot in Figure 2 which identifies the outage and the two overloaded lines.
4. Two (2) 500 kV circuits (IMPLVLY-ECO and ECO-MIGUEL) are loaded above 99% under a single contingency. If these circuits become overloaded (>100%) due to extreme weather or higher imports, the CAISO has planned an SPS to mitigate these overloads through generation tripping or dropping.

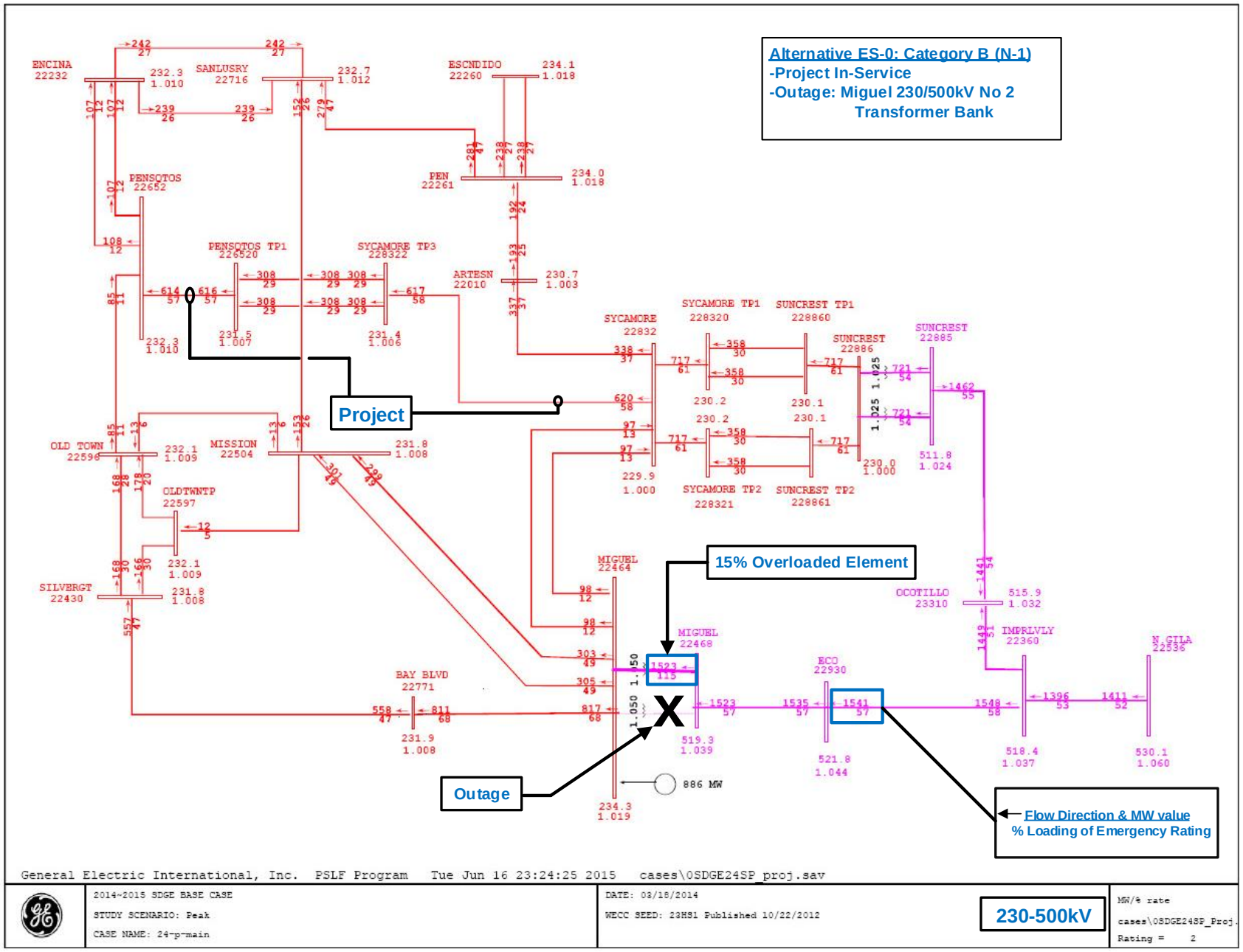


Figure 2 - ES-0, Power Flow Plot for Category B contingencies (230/500 kV System)

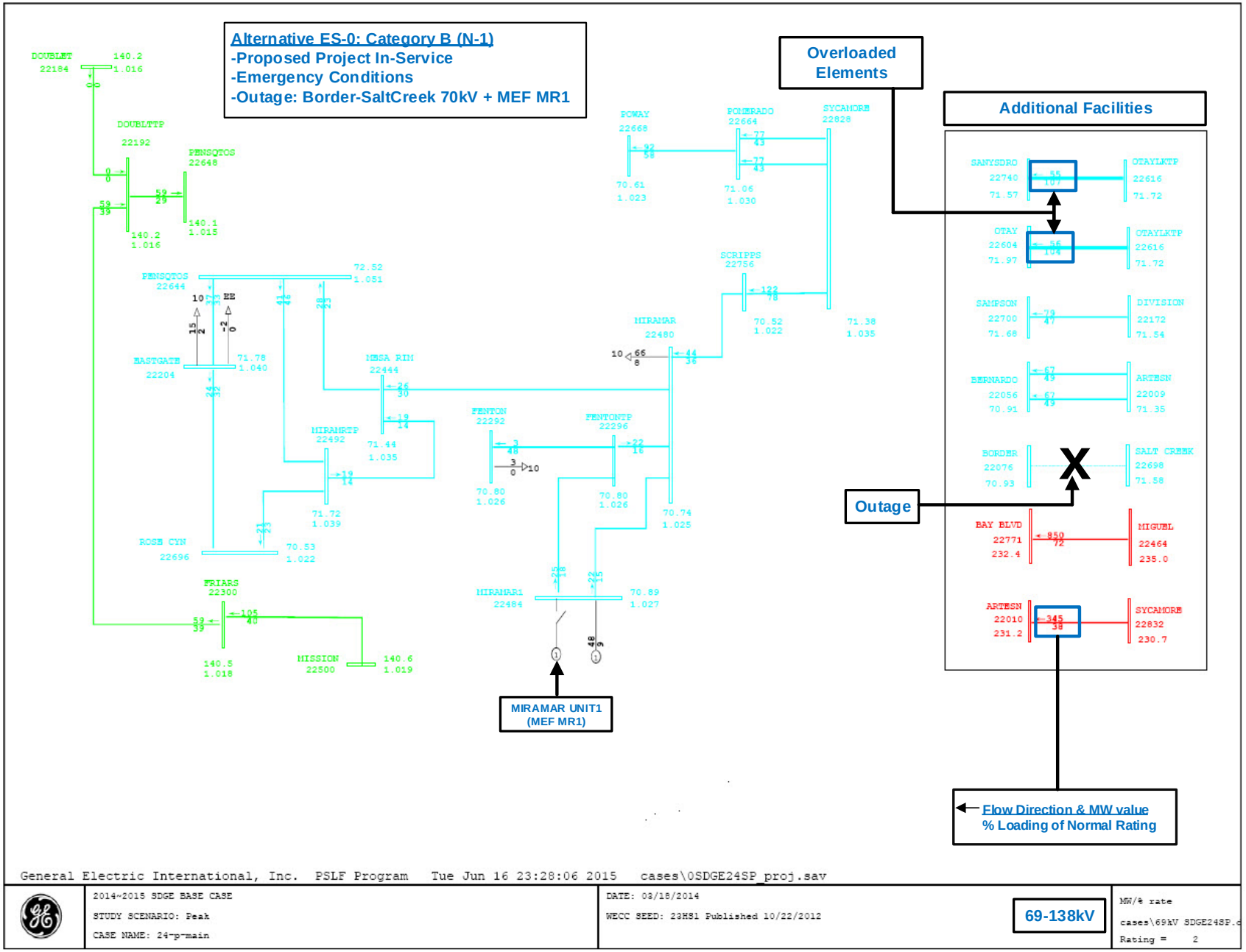


Figure 3 - ES-0, Power Flow Plot for Category B contingencies (69/138 kV System)

Alternative ES-1: No Project

The "No Project" alternative further establishes a base framework for implementing the various alternatives to be studied. This study case is derived from **Alternative ES-0: Proposed Project** base case and effectively removes the Proposed Project (Sycamore-Penasquitos 230 kV line along with the configuration of the Mission-SLR 230 kV lines and other associated upgrades). All other approved transmission projects, generation and dispatch levels and system loads remain. Following are the resultant line flows for the worst outage conditions.

Alternative ES-1: No Project
SDG&E 2024 Reliability case
Single Contingency (Category B) Outages
Facilities loaded above 95% of Emergency Rating

Facility								Worst Outage	Loading				Worst Outage Description
From	Name	kV	To	Name	kV	ck	Rated MVA		%	MW	MVAR	AMPS	
22468	MIGUEL	500	22472	MIGUELMP	500	1	1329	T-5073	117.7%	1535	304	1743	22464 MIGUEL 230 22468 MIGUEL 500 2
22464	MIGUEL	230	22472	MIGUELMP	500	1	1329	T-5073	115.7%	-1532	-16	3789	22464 MIGUEL 230 22468 MIGUEL 500 2
22464	MIGUEL	230	22468	MIGUEL	500	2	1344	T-5075	115.0%	-1512	-11	3740	22468 MIGUEL 500 22472 MIGUELMP 500 1
22192	DOUBLTTP	138	22300	FRIARS	138	1	150	70027	111.7%	-165	39	700	22652 PENSQTOS 230 22596 OLD TOWN 230 1 + MEF MR1
22828	SYCAMORE	69	22756	SCRIPPS	69	1	154	70025	111.6%	175	8	1438	22771 BAY BLVD 230 22464 MIGUEL 230 1 + MEF MR1
22668	POWAY	69	22664	POMERADO	69	1	155	SL-5063	107.7%	-169	14	1397	22010 ARTESN 230 22832 SYCAMORE 230 1
22740	SANYSDRO	69	22616	OTAYLKTP	69	1	50	70035	107.3%	-55	5	448	22076 BORDER 69 22698 SALT CREEK 69 1 + MEF MR1
22604	OTAY	69	22616	OTAYLKTP	69	1	61	SL-1026	103.5%	-56	34	528	22076 BORDER 69 22698 SALT CREEK 69 1
22360	IMPRLVLY	500	22930	ECO	500	1	2598	SPS2-50286	99.1%	2589	368	2968	Line OCOTILLO-SUNCREST 500kV & Xtrip Only
22930	ECO	500	22468	MIGUEL	500	1	2598	SPS2-50286	98.9%	2562	42	2963	Line OCOTILLO-SUNCREST 500kV & Xtrip Only
22464	MIGUEL	230	22504	MISSION	230	1	605	70025	98.5%	601	45	1495	22771 BAY BLVD 230 22464 MIGUEL 230 1 + MEF MR1
22464	MIGUEL	230	22504	MISSION	230	2	605	70025	97.9%	598	43	1487	22771 BAY BLVD 230 22464 MIGUEL 230 1 + MEF MR1
22700	SAMPSON	69	22172	DIVISION	69	1	172	70026	97.1%	-167	40	1398	22430 SILVERGT 230 22771 BAY BLVD 230 1 + MEF MR1
228320	SYCAMORE TP1	230	22832	SYCAMORE	230	1	1183	SPS1-50285	97.0%	1117	43	2879	Line ECO-MIGUEL 500kV & Xtrip Only
228321	SYCAMORE TP2	230	22832	SYCAMORE	230	2	1183	SPS1-50285	97.0%	1117	43	2879	Line ECO-MIGUEL 500kV & Xtrip Only
22886	SUNCREST	230	228860	SUNCREST TP1	230	1	1183	SPS1-50285	96.9%	1122	22	2877	Line ECO-MIGUEL 500kV & Xtrip Only
22886	SUNCREST	230	228861	SUNCREST TP2	230	2	1183	SPS1-50285	96.9%	1122	22	2877	Line ECO-MIGUEL 500kV & Xtrip Only
22771	BAY BLVD	230	22464	MIGUEL	230	1	1175	70029	96.6%	-1138	20	2850	22464 MIGUEL 230 22504 MISSION 230 1 + MEF MR1
22056	BERNARDO	69	22009	ARTESN	69	1	137	70037	96.0%	-132	-26	1100	22056 BERNARDO 69 22009 ARTESN 69 2 + MEF MR1
22056	BERNARDO	69	22009	ARTESN	69	2	137	70036	96.0%	-132	-26	1100	22056 BERNARDO 69 22009 ARTESN 69 1 + MEF MR1

Alternative ES-1: No Project

SDG&E 2024 Reliability case

Double Contingency (Category C) Outages

Facilities loaded above 95% of Emergency Rating

Facility								Worst Outage	Loading				Worst Outage Description
From	Name	kV	To	Name	kV	ck	Rated MVA		%	MW	MVAR	AMPS	
22306	GARFIELD	69	22208	EL CAJON	69	1	102	Bus_MS69S	127.9%	-130	-19	1092	Mission 69kV S Bus
22668	POWAY	69	22664	POMERADO	69	1	155	23051/6920	127.6%	-200	20	1655	SX-AR 230 kV + SX-AR 69 kV
22468	MIGUEL	500	22472	MIGUELMP	500	1	1329	ML-2T	118.2%	1543	297	1748	MIGUEL 230 kV 2T CB
22740	SANYSDRO	69	22616	OTAYLKTP	69	1	50	Bus_OY69E	117.3%	-59	9	489	Otay 69kV E Bus
22464	MIGUEL	230	22472	MIGUELMP	500	1	1329	ML-2T	116.2%	-1540	-7	3800	MIGUEL 230 kV 2T CB
22856	TOREYPNS	69	22200	DUNHILTP	69	1	126	662/6905	115.5%	-149	-21	1218	PQ-TP + PQ-GE
22771	BAY BLVD	230	22464	MIGUEL	230	1	1175	23022/23023	114.9%	-1349	45	3390	ML-MS 230 kV #1&#2
22356	IMPRLVLY	230	22360	IMPRLVLY	500	2	732	IV-8022	114.0%	820	-9	2054	IV 8022 50002 & BK81 CB
22609	OTAYMESA	230	20149	TJI-230	230	1	796	23041B/42B	114.0%	891	163	2277	OMGP-ML #1+#2 230 kV
22192	DOUBLTTP	138	22300	FRIARS	138	1	150	OT-2N	111.7%	-165	40	700	OLD TOWN 230 kV 2N CB
22420	SILVERGT	69	22868	URBAN	69	1	100	655/699	109.6%	104	46	914	SG-CR + SG-B
22532	MURRAY	69	22306	GARFIELD	69	1	97	Bus_MS69S	109.2%	-105	-13	886	Mission 69kV S Bus
22828	SYCAMORE	69	22756	SCRIPPS	69	1	154	Bus_MRGT69	109.0%	172	8	1405	Miramar1 (GT) 69kV Bus
22188	DOUBLTTP	69	22164	DELMARTP	69	1	136	662/6905	108.9%	-152	-24	1239	PQ-TP + PQ-GE
22200	DUNHILTP	69	22188	DOUBLTTP	69	1	136	662/6905	108.9%	-152	-23	1239	PQ-TP + PQ-GE
22644	PENSQTOS	69	22164	DELMARTP	69	1	136	662/6905	108.9%	153	28	1238	PQ-TP + PQ-GE
22261	PEN	230	22716	SANLUSRY	230	1	593	23014/23015	108.8%	648	-33	1619	PEN-ES #1 + #2 230 kV
22771	BAY BLVD	230	22768	BAY BLVD	69	2	285	BB-1T	107.6%	294	88	766	BAYBLVD 230 kV 1T CB
22464	MIGUEL	230	22504	MISSION	230	1	605	13815/23042	107.3%	654	57	1629	BB-ML & GRNTHIL-SY
22464	MIGUEL	230	22504	MISSION	230	2	605	13815/23042	106.7%	651	55	1620	BB-ML & GRNTHIL-SY
22020	AVOCADO	69	22508	MNSRATTP	69	1	52	Bus_MN69	105.4%	-55	1	459	Monserate 69kV S Bus
22400	LASPULGS	69	22368	JAP MESA	69	1	32	23007OH2/52	105.0%	33	-8	281	SMESA-TA+SMESA-CAP 230
22056	BERNARDO	69	22284	FELCTATP	69	1	102	23014/23015	102.7%	105	-19	877	PEN-ES #1 + #2 230 kV
22360	IMPRLVLY	500	22911	IV MP	500	1	1329	IV-8022	101.8%	-1325	268	1512	IV 8022 50002 & BK81 CB
22356	IMPRLVLY	230	22911	IV MP	500	1	1329	IV-8022	101.8%	1327	-13	3327	IV 8022 50002 & BK81 CB
22476	MIGUELTP	69	22456	MIGUEL	69	1	136	13815/23042	99.5%	-136	12	1132	BB-ML & GRNTHIL-SY
22331	MIRASNTO	69	22644	PENSQTOS	69	1	136	662/6905	99.4%	-140	-17	1131	PQ-TP + PQ-GE
22444	MESA RIM	69	22480	MIRAMAR	69	1	114	13815/23042	98.6%	-108	37	940	BB-ML & GRNTHIL-SY
22440	MELROSE	69	22442	MELRSETP	69	1	102	69XX/69XY	98.0%	-100	-12	836	OR-SA CKT 1&2
22430	SILVERGT	230	22596	OLD TOWN	230	1	587	23027/23028	97.9%	555	-156	1442	23027/28 OT-MS & OT-SG-MS
22596	OLD TOWN	230	22504	MISSION	230	1	456	23028/23029	97.7%	-430	122	1118	SG-OT 230kV #1+#2
22664	POMERADO	69	22828	SYCAMORE	69	2	174	Bus_SX69S	97.5%	-173	-9	1419	Sycamore 69kV S Bus
22504	MISSION	230	22496	MISSION	69	2	285	Bus_MS69S	96.5%	271	46	687	Mission 69kV S Bus

Key Points:

Numerous 230 kV and 69 kV overloads and some circuits loaded as high as 99% under single and double contingencies are identified. This result was fully anticipated and clearly indicates a need for one or more projects to mitigate all such single contingency overloads. This view underscores the need or justification for a new project as was originally identified in the CAISO 2012/2013 Transmission Plan.

Figure 4 displays the power flow plots for the **ES-1 No Project** alternative under Normal conditions (N-0). Note the project lines are effectively removed (shown as dotted lines) and the Mission-SLR 230 kV lines are configured as they exist today. We also note here the Tap that interconnects the Palomar Energy Center (PEN) and 230 kV line from Encina to San Luis Rey is not shown, but rather we show the two 230 kV lines from Encina to SLR, and the single 230 kV line from PEN to SLR. This reconfiguration would be the result of proposed Encina Hub to SLR, which is a component of the Proposed Project. Electrically, the topology as shown in the No Project alternative, and alternatives ES-2 through ES-7, is essentially equivalent and has little to no impact on the power flow results.

Figures 5 and 6 display the 69/138 kV power flow plot for Normal conditions and a single contingency (Penasquitos-Old Town 230 kV line outage – with one CT off-line at Miramar) respectively.

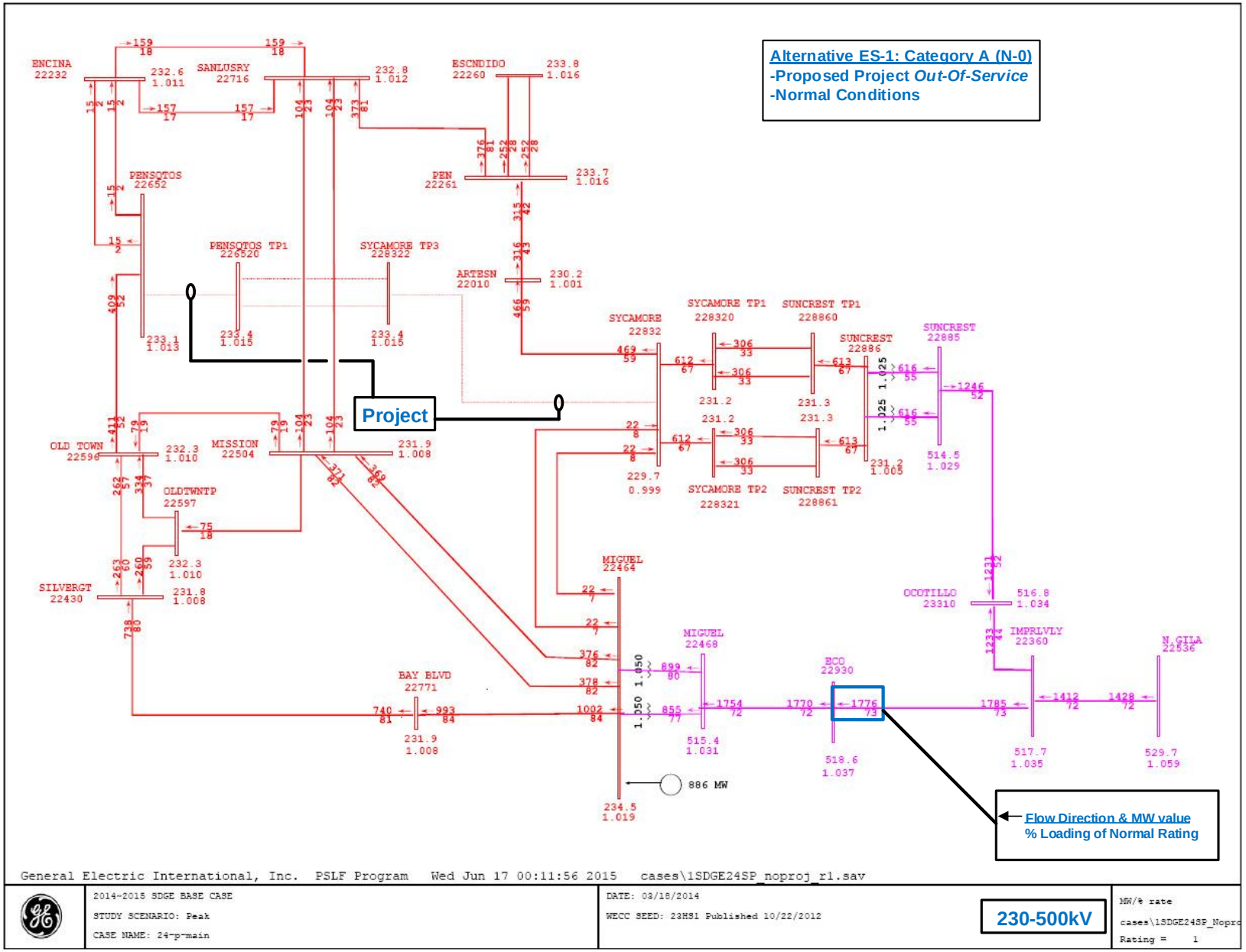


Figure 4 - ES-1, 230/500 kV Power Flow Plot, Normal condition

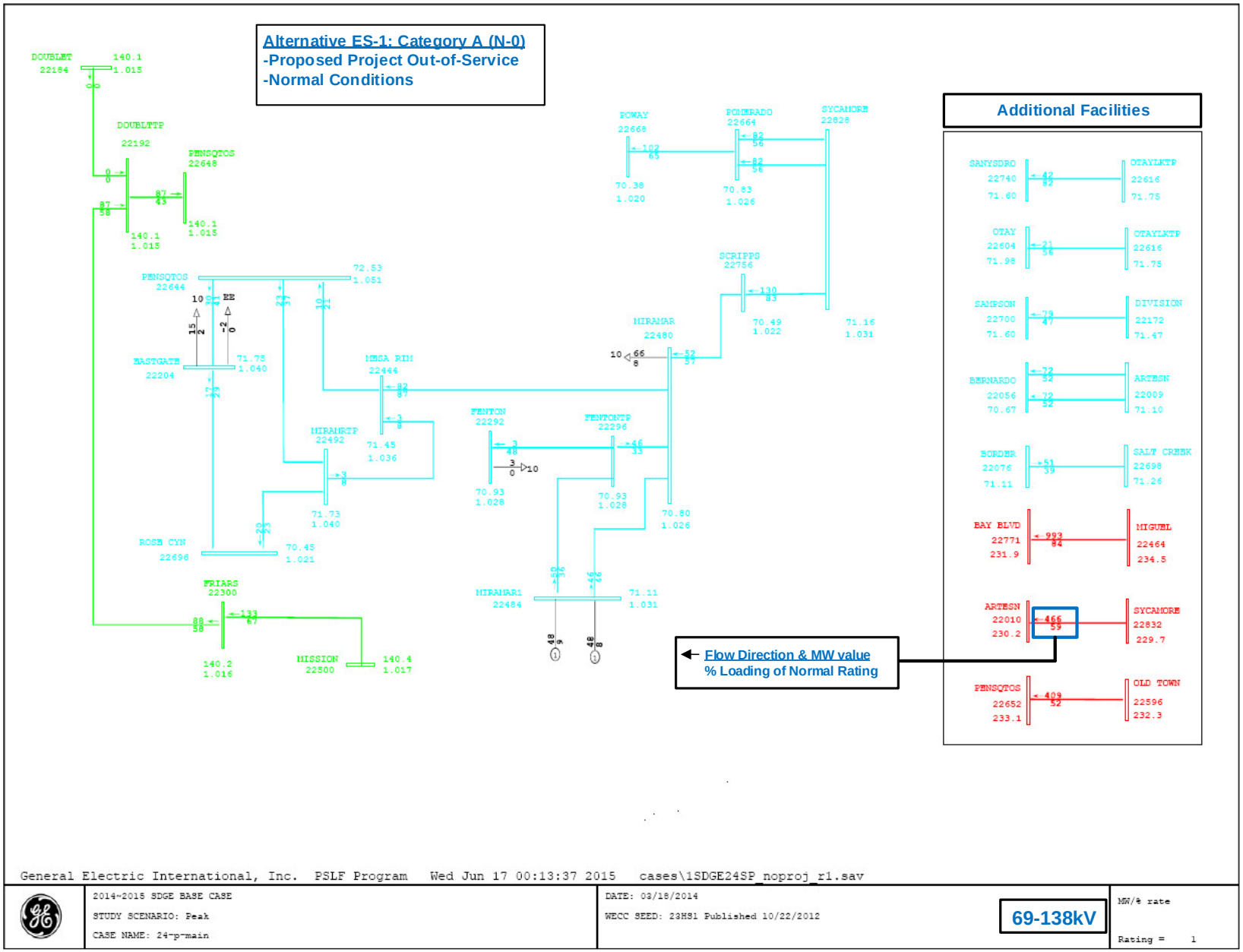


Figure 5 - ES-1, 69/138 kV Power Flow Plot, Normal condition

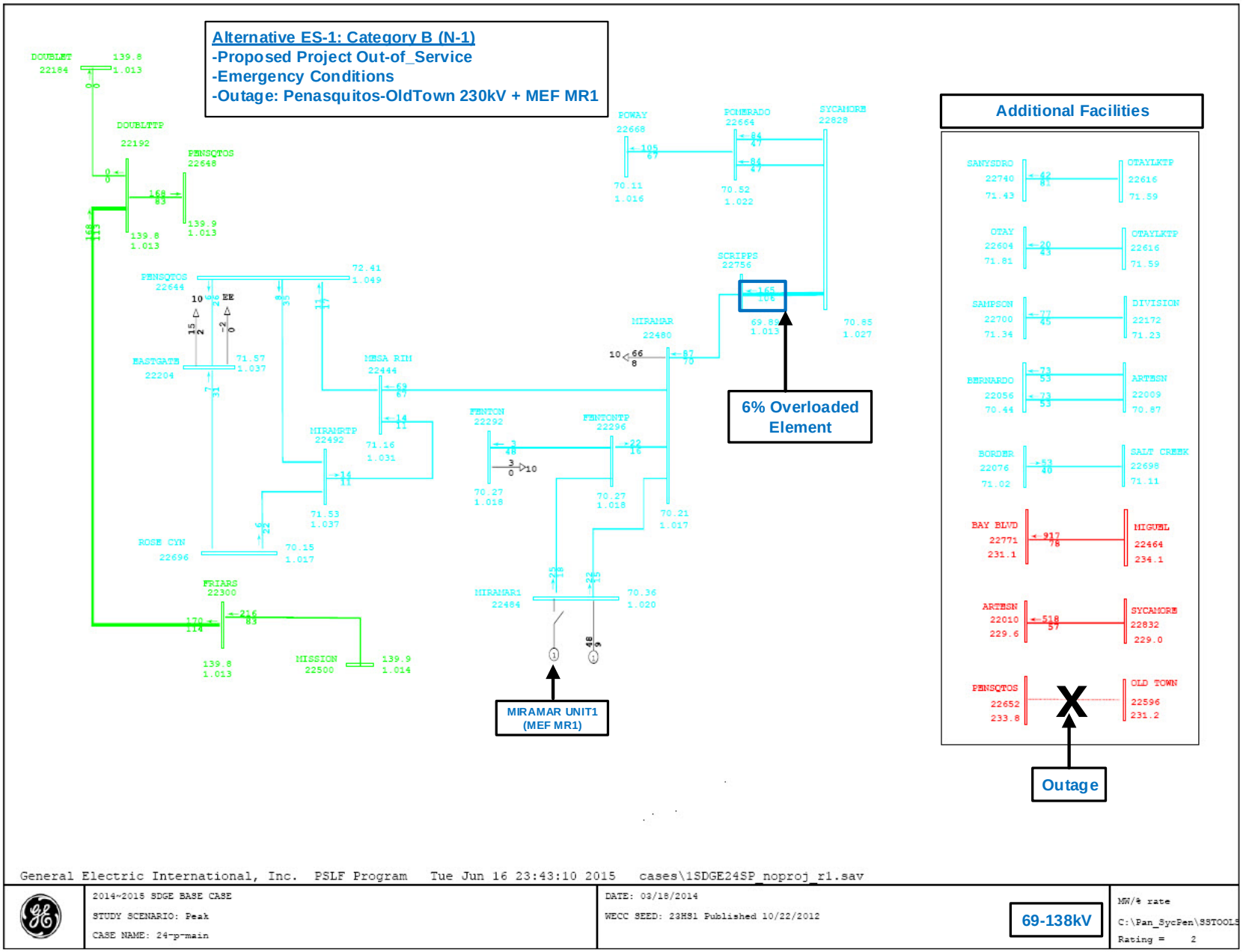


Figure 6 - ES-1, 69/138 kV Power Flow Plot, Single contingency condition

Alternative ES-2: ES-1 (No Project) plus the Mission-Penasquitos 230 kV line

This study case is derived from the **Alternative ES-1: No Project** base case, which effectively removed the Proposed Project, and modeled in the Mission to Penasquitos 230 kV line, as recently approved by the CAISO in the 2014/2015 Transmission Plan. The associated parameters and attributes were provided by the CAISO in GE PSLF (.epc) file format. All other approved transmission projects, generation and dispatch levels and system loads remain. Following are the resultant line flows for the worst outage conditions.

Alternative ES-2: ES-1 + CAISO Approved Mission-Penasquitos 230 kV Line
SDG&E 2024 Reliability case
Single Contingency (Category B) Outages
Facilities loaded above 95% of Emergency Rating

Facility								Worst Outage	Loading				Worst Outage Description
From	Name	kV	To	Name	kV	ck	Rated MVA		%	MW	MVAR	AMPS	
22468	MIGUEL	500	22472	MIGUELMP	500	1	1329	T-5073	118.0%	1539	303	1747	22464 MIGUEL 230 22468 MIGUEL 500 2
22464	MIGUEL	230	22472	MIGUELMP	500	1	1329	T-5073	116.0%	-1536	-13	3798	22464 MIGUEL 230 22468 MIGUEL 500 2
22464	MIGUEL	230	22468	MIGUEL	500	2	1344	T-5074	115.3%	-1516	-8	3749	22464 MIGUEL 230 22472 MIGUELMP 500 1
22828	SYCAMORE	69	22756	SCRIPPS	69	1	154	70025	110.3%	173	8	1421	22771 BAY BLVD 230 22464 MIGUEL 230 1 + MEF MR1
22740	SANYSDRO	69	22616	OTAYLKTP	69	1	50	70035	107.3%	-55	5	448	22076 BORDER 69 22698 SALT CREEK 69 1 + MEF MR1
22668	POWAY	69	22664	POMERADO	69	1	155	SL-5063	106.7%	-167	14	1384	22010 ARTESN 230 22832 SYCAMORE 230 1
22604	OTAY	69	22616	OTAYLKTP	69	1	61	SL-1026	103.6%	-56	34	528	22076 BORDER 69 22698 SALT CREEK 69 1
22464	MIGUEL	230	22504	MISSION	230	1	605	70025	99.5%	607	43	1511	22771 BAY BLVD 230 22464 MIGUEL 230 1 + MEF MR1
22360	IMPRLVLY	500	22930	ECO	500	1	2598	SPS2-50286	99.2%	2594	368	2974	Line OCOTILLO-SUNCREST 500kV & Xtrip Only
22930	ECO	500	22468	MIGUEL	500	1	2598	SPS2-50286	99.1%	2567	40	2969	Line OCOTILLO-SUNCREST 500kV & Xtrip Only
22464	MIGUEL	230	22504	MISSION	230	2	605	70025	98.9%	604	40	1502	22771 BAY BLVD 230 22464 MIGUEL 230 1 + MEF MR1
228320	SYCAMORE TP1	230	22832	SYCAMORE	230	1	1183	SPS1-50285	97.0%	1117	42	2880	Line ECO-MIGUEL 500kV & Xtrip Only
228321	SYCAMORE TP2	230	22832	SYCAMORE	230	2	1183	SPS1-50285	97.0%	1117	42	2880	Line ECO-MIGUEL 500kV & Xtrip Only
22700	SAMPSON	69	22172	DIVISION	69	1	172	70026	96.9%	-166	40	1394	22430 SILVERGT 230 22771 BAY BLVD 230 1 + MEF MR1
22886	SUNCREST	230	228860	SUNCREST TP1	230	1	1183	SPS1-50285	96.9%	1122	21	2878	Line ECO-MIGUEL 500kV & Xtrip Only
22886	SUNCREST	230	228861	SUNCREST TP2	230	2	1183	SPS1-50285	96.9%	1122	21	2878	Line ECO-MIGUEL 500kV & Xtrip Only
22771	BAY BLVD	230	22464	MIGUEL	230	1	1175	70029	96.6%	-1139	22	2850	22464 MIGUEL 230 22504 MISSION 230 1 + MEF MR1
22056	BERNARDO	69	22009	ARTESN	69	1	137	70037	95.7%	-131	-26	1098	22056 BERNARDO 69 22009 ARTESN 69 2 + MEF MR1
22056	BERNARDO	69	22009	ARTESN	69	2	137	70036	95.7%	-131	-26	1098	22056 BERNARDO 69 22009 ARTESN 69 1 + MEF MR1

Alternative ES-2: ES-1 + CAISO Approved Mission-Penasquitos 230 kV Line

SDG&E 2024 Reliability case

Double Contingency (Category C) Outages

Facilities loaded above 95% of Emergency Rating

Facility									Loading				
From	Name	kV	To	Name	kV	ck	Rated MVA	Worst Outage	%	MW	MVAR	AMPS	Worst Outage Description
22306	GARFIELD	69	22208	EL CAJON	69	1	102	Bus_MS69S	128.0%	-130	-18	1093	Mission 69kV S Bus
22668	POWAY	69	22664	POMERADO	69	1	155	23051/6920	126.3%	-198	19	1639	SX-AR 230 kV + SX-AR 69 kV
22468	MIGUEL	500	22472	MIGUELMP	500	1	1329	ML-2T	118.5%	1547	295	1753	MIGUEL 230 kV 2T CB
22740	SANYSDRO	69	22616	OTAYLKTP	69	1	50	Bus_OY69E	117.2%	-59	9	489	Otay 69kV E Bus
22464	MIGUEL	230	22472	MIGUELMP	500	1	1329	ML-2T	116.6%	-1544	-4	3810	MIGUEL 230 kV 2T CB
22856	TOREYPNS	69	22200	DUNHILTP	69	1	126	662/6905	115.5%	-149	-21	1218	PQ-TP + PQ-GE
22771	BAY BLVD	230	22464	MIGUEL	230	1	1175	23022/23023	115.1%	-1351	48	3394	ML-MS 230 kV #1&#2
22356	IMPRLVLY	230	22360	IMPRLVLY	500	2	732	IV-8022	114.1%	820	-10	2056	IV 8022 50002 & BK81 CB
22609	OTAYMESA	230	20149	TJI-230	230	1	796	23041B/42B	114.0%	891	163	2277	OMGP-ML #1+#2 230 kV
22420	SILVERGT	69	22868	URBAN	69	1	100	655/699	109.4%	104	46	912	SG-CR + SG-B
22532	MURRAY	69	22306	GARFIELD	69	1	97	Bus_MS69S	109.3%	-105	-13	887	Mission 69kV S Bus
22188	DOUBLTTP	69	22164	DELMARTP	69	1	136	662/6905	108.9%	-152	-24	1239	PQ-TP + PQ-GE
22200	DUNHILTP	69	22188	DOUBLTTP	69	1	136	662/6905	108.9%	-152	-23	1239	PQ-TP + PQ-GE
22644	PENSQTOS	69	22164	DELMARTP	69	1	136	662/6905	108.9%	153	28	1238	PQ-TP + PQ-GE
22464	MIGUEL	230	22504	MISSION	230	1	605	13815/23042	108.3%	661	55	1644	BB-ML & GRNTHIL-SY
22261	PEN	230	22716	SANLUSRY	230	1	593	23014/23015	108.0%	644	-33	1608	PEN-ES #1 + #2 230 kV
22828	SYCAMORE	69	22756	SCRIPPS	69	1	154	Bus_MRGT69	107.8%	170	8	1389	Miramar1 (GT) 69kV Bus
22464	MIGUEL	230	22504	MISSION	230	2	605	13815/23042	107.6%	657	52	1635	BB-ML & GRNTHIL-SY
22771	BAY BLVD	230	22768	BAY BLVD	69	2	285	BB-1T	107.4%	293	88	765	BAYBLVD 230 kV 1T CB
22400	LASPULGS	69	22368	JAP MESA	69	1	32	23007OH2/52	105.2%	33	-8	282	SMESA-TA+SMESA-CAP 230
22020	AVOCADO	69	22508	MNSRATTP	69	1	52	Bus_MN69	105.1%	-55	1	457	Monserate 69kV S Bus
22056	BERNARDO	69	22284	FELCTATP	69	1	102	23014/23015	102.0%	105	-19	871	PEN-ES #1 + #2 230 kV
22360	IMPRLVLY	500	22911	IV MP	500	1	1329	IV-8022	101.9%	-1326	269	1513	IV 8022 50002 & BK81 CB
22356	IMPRLVLY	230	22911	IV MP	500	1	1329	IV-8022	101.9%	1329	-14	3330	IV 8022 50002 & BK81 CB
22331	MIRASNTO	69	22644	PENSQTOS	69	1	136	662/6905	99.4%	-140	-17	1131	PQ-TP + PQ-GE
22476	MIGUELTP	69	22456	MIGUEL	69	1	136	13815/23042	99.3%	-136	12	1130	BB-ML & GRNTHIL-SY
22440	MELROSE	69	22442	MELRSETP	69	1	102	69XX/69XY	98.0%	-100	-12	836	OR-SA CKT 1&2
22664	POMERADO	69	22828	SYCAMORE	69	2	174	Bus_SX69S	97.2%	-173	-9	1416	Sycamore 69kV S Bus
22444	MESA RIM	69	22480	MIRAMAR	69	1	114	13815/23042	96.9%	-107	36	923	BB-ML & GRNTHIL-SY
22504	MISSION	230	22496	MISSION	69	2	285	Bus_MS69S	95.4%	268	46	678	Mission 69kV S Bus

Key Points:

1. This scenario shows two (2) additional 69 kV overloads as compared to the proposed project, ES-0. These overloads must be mitigated.
2. Numerous 69 kV, 230 kV and 500 kV lines are loaded above 95% and as high as 99.5% under single contingency. These circuits are likely to tip the overload point between 1-3 years beyond 2024 and will require mitigation. Specifically, Miguel-Mission lines #1 & #2 are loaded to 99% and may need upgrades soon after 2024.
3. The four (4) 230 kV circuits overloaded under ES-0 are reduced (loaded to 97%) in this alternative. Possible mitigation may be delayed for 2-3 years.

Following in Figures 7, 8, 9 and 10 are the associated power flow plots for 230/500 kV Normal conditions, 69/138 kV Normal conditions, 69/138 kV (L-1, G-1) single contingency (Bay Blvd-Miguel 230 kV + Miramar Unit 1), and Border-Salt Creek + Miramar Unit 1, respectively.

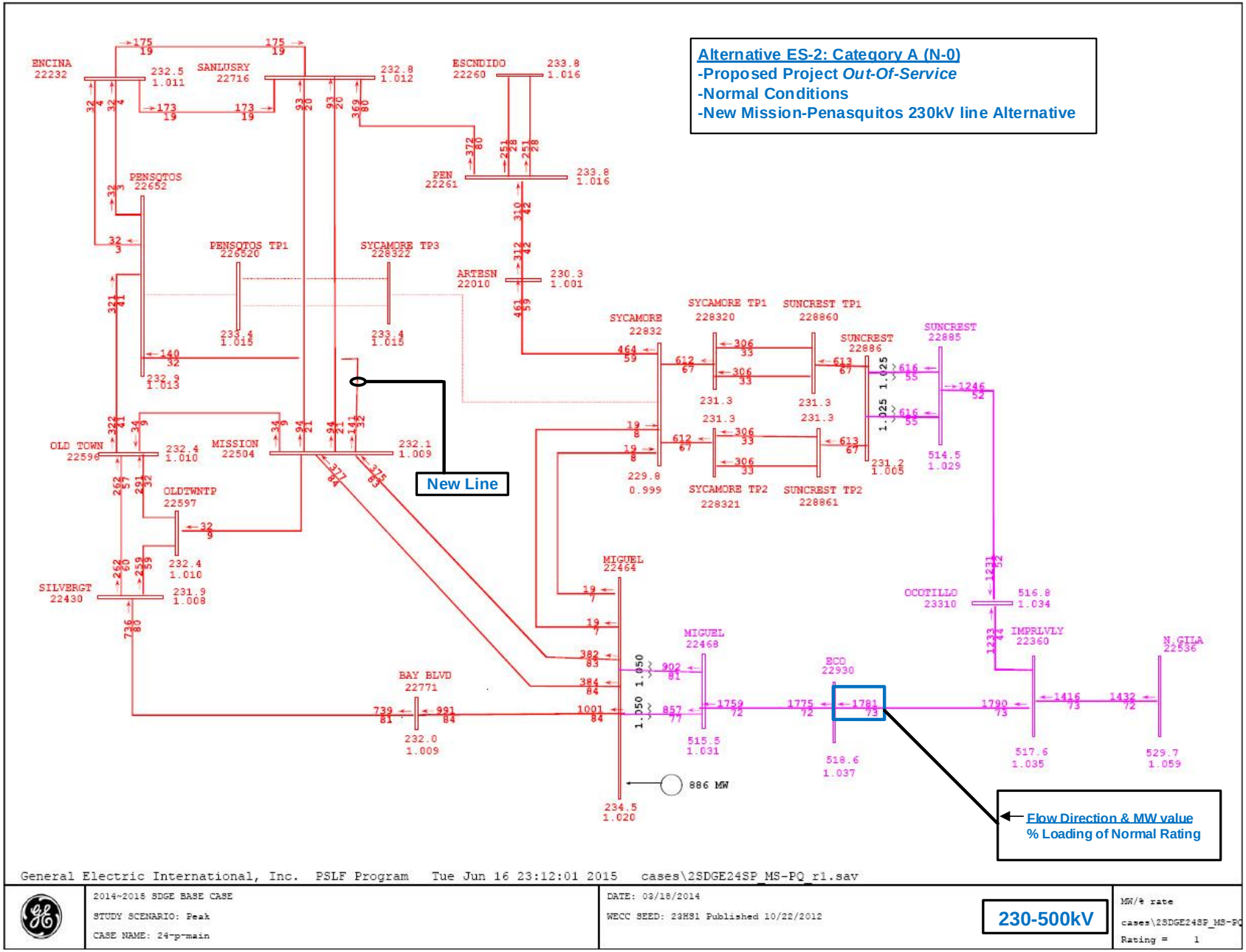


Figure 7 – ES-2, 230/500 kV Power Flow Plot, Normal conditions

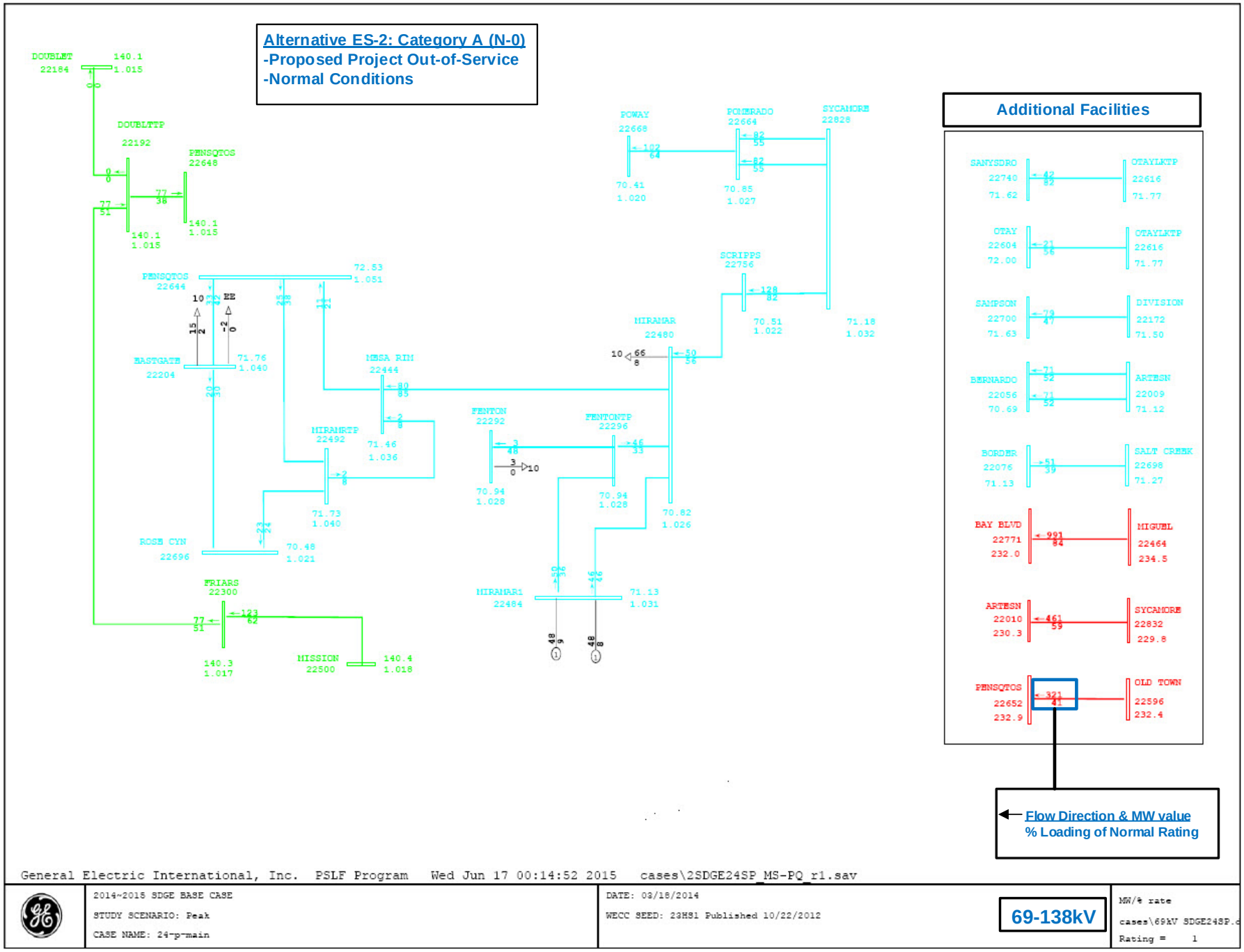


Figure 8 – ES-2, 69/138 kV Power Flow Plot, Normal conditions

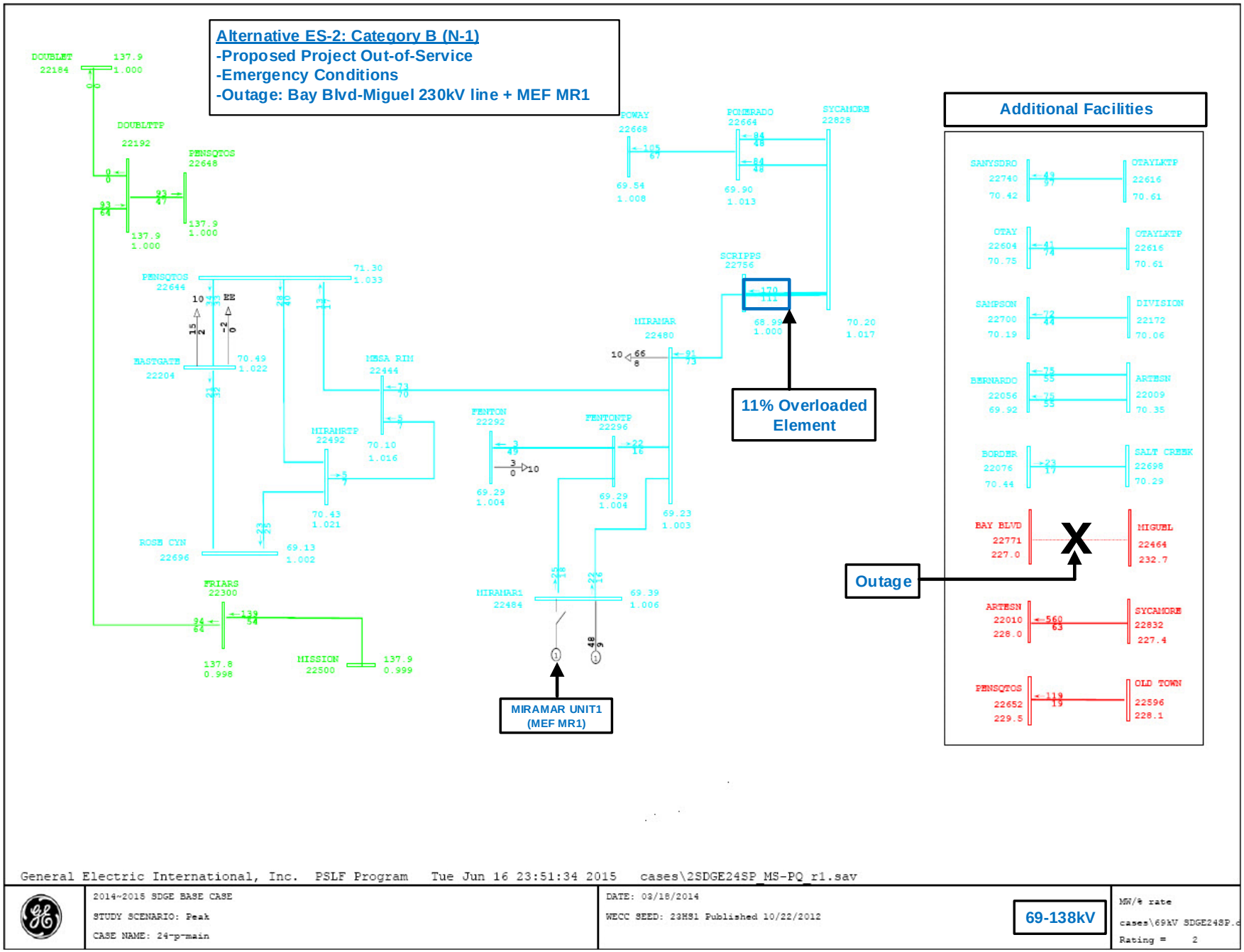


Figure 9 – ES-2, 69/138 kV Power Flow Plot, Single contingency

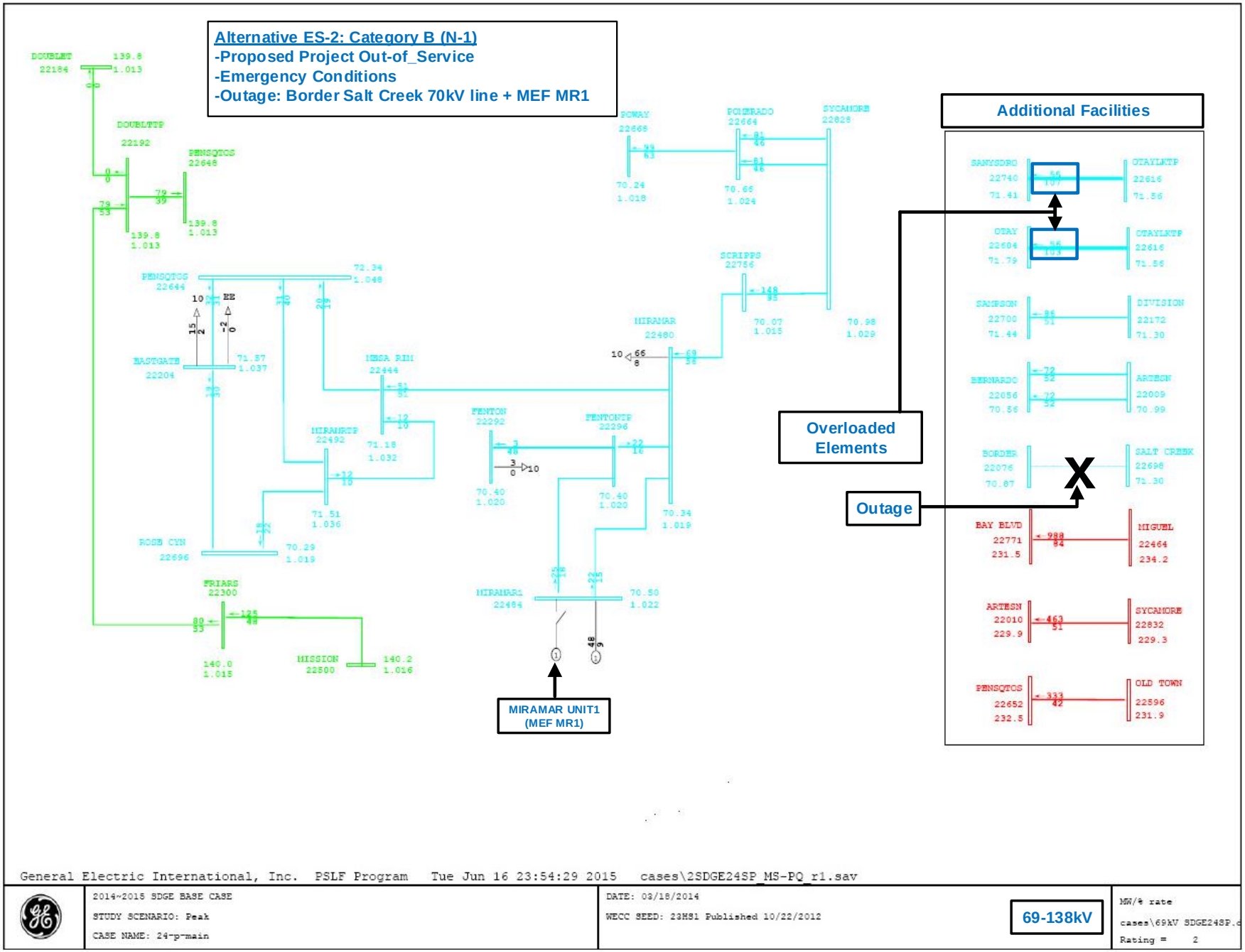


Figure 10 – ES-2, 69/138 kV Power Flow Plot, Single contingency

Alternative ES-3: Consists of ES-1 plus CAISO approved Mission-Penasquitos 230 kV Line and a New Sycamore-Mission 230 kV line

This study case is derived from the **Alternative ES-1: No Project** base case, which effectively removed the Proposed Project, and modeled in the Mission to Penasquitos 230 kV line, as recently approved by the CAISO in the 2014/2015 Transmission Plan, and added a new 230 kV circuit from Sycamore to Mission. This arrangement is effectively very similar to the Proposed Project in that it provides a new 230 kV circuit between Sycamore and Penasquitos. Following are the resultant line flows for the worst outage conditions.

Alternative ES-3: ES-1 + CAISO Approved Mission-Penasquitos 230 kV line and New Sycamore-Mission 230 kV Line
SDG&E 2024 Reliability case
Single Contingency (Category B) Outages
Facilities loaded above 95% of Emergency Rating

Facility								Worst Outage	Loading				Worst Outage Description
From	Name	kV	To	Name	kV	ck	Rated MVA		%	MW	MVAR	AMPS	
22468	MIGUEL	500	22472	MIGUELMP	500	1	1329	T-5073	115.4%	1504	299	1704	22464 MIGUEL 230 22468 MIGUEL 500 2
22464	MIGUEL	230	22472	MIGUELMP	500	1	1329	T-5073	113.4%	-1501	-24	3705	22464 MIGUEL 230 22468 MIGUEL 500 2
22464	MIGUEL	230	22468	MIGUEL	500	2	1344	T-5074	112.7%	-1481	-19	3656	22464 MIGUEL 230 22472 MIGUELMP 500 1
22740	SANYSDRO	69	22616	OTAYLKTP	69	1	50	70035	107.3%	-55	5	448	22076 BORDER 69 22698 SALT CREEK 69 1 + MEF MR1
22604	OTAY	69	22616	OTAYLKTP	69	1	61	SL-1026	103.7%	-56	34	529	22076 BORDER 69 22698 SALT CREEK 69 1
22886	SUNCREST	230	228860	SUNCREST TP1	230	1	1183	SPS1-50285	99.6%	1157	-6	2959	Line ECO-MIGUEL 500kV & Xtrip Only
22886	SUNCREST	230	228861	SUNCREST TP2	230	2	1183	SPS1-50285	99.6%	1157	-6	2959	Line ECO-MIGUEL 500kV & Xtrip Only
228320	SYCAMORE TP1	230	22832	SYCAMORE	230	1	1183	SPS1-50285	99.5%	1152	12	2956	Line ECO-MIGUEL 500kV & Xtrip Only
228321	SYCAMORE TP2	230	22832	SYCAMORE	230	2	1183	SPS1-50285	99.5%	1152	12	2956	Line ECO-MIGUEL 500kV & Xtrip Only
22360	IMPRLVLY	500	22930	ECO	500	1	2598	SPS2-50286	99.3%	2597	367	2976	Line OCOTILLO-SUNCREST 500kV & Xtrip Only
22930	ECO	500	22468	MIGUEL	500	1	2598	SPS2-50286	99.2%	2570	38	2971	Line OCOTILLO-SUNCREST 500kV & Xtrip Only
22596	OLD TOWN	230	22504	MISSION	230	1	456	70025	95.0%	-425	66	1087	22771 BAY BLVD 230 22464 MIGUEL 230 1 + MEF MR1

Alternative ES-3: ES-1 + CAISO Approved Mission-Penasquitos 230 kV Line and New Sycamore-Mission 230 kV line
SDG&E 2024 Reliability case
Double Contingency (Category C) Outages
Facilities loaded above 95% of Emergency Rating

Facility								Worst Outage	Loading				Worst Outage Description
From	Name	kV	To	Name	kV	ck	Rated MVA		%	MW	MVAR	AMPS	
22306	GARFIELD	69	22208	EL CAJON	69	1	102	Bus_MS69S	122.1%	-124	-20	1042	Mission 69kV S Bus
22856	TOREYPNS	69	22200	DUNHILTP	69	1	126	662/6905	115.5%	-149	-21	1217	PQ-TP + PQ-GE
22356	IMPRLVLY	230	22360	IMPRLVLY	500	2	732	IV-8022	114.7%	824	-12	2066	IV 8022 50002 & BK81 CB
22468	MIGUEL	500	22472	MIGUELMP	500	1	1329	ML-2T	114.7%	1495	295	1692	MIGUEL 230 kV 2T CB
22740	SANYSDRO	69	22616	OTAYLKTP	69	1	50	Bus_OY69E	114.5%	-58	9	477	Otay 69kV E Bus
22609	OTAYMESA	230	20149	TJI-230	230	1	796	23041B/42B	114.0%	891	162	2277	OMGP-ML #1+#2 230 kV
22464	MIGUEL	230	22472	MIGUELMP	500	1	1329	ML-2T	112.7%	-1493	-23	3678	MIGUEL 230 kV 2T CB
22668	POWAY	69	22664	POMERADO	69	1	155	23051/6920	110.0%	-173	13	1427	SX-AR 230 kV + SX-AR 69 kV
22188	DOUBLTTP	69	22164	DELMARTP	69	1	136	662/6905	108.8%	-152	-24	1238	PQ-TP + PQ-GE
22200	DUNHILTP	69	22188	DOUBLTTP	69	1	136	662/6905	108.8%	-152	-23	1238	PQ-TP + PQ-GE
22644	PENSQTOS	69	22164	DELMARTP	69	1	136	662/6905	108.8%	153	28	1237	PQ-TP + PQ-GE
22400	LASPULGS	69	22368	JAP MESA	69	1	32	23007OH2/52	108.2%	34	-8	290	SMESA-TA+SMESA-CAP 230
22420	SILVERGT	69	22868	URBAN	69	1	100	655/699	107.5%	101	47	897	SG-CR + SG-B
22532	MURRAY	69	22306	GARFIELD	69	1	97	Bus_MS69S	103.1%	-99	-15	837	Mission 69kV S Bus
22360	IMPRLVLY	500	22911	IV MP	500	1	1329	IV-8022	102.4%	-1332	275	1521	IV 8022 50002 & BK81 CB
22356	IMPRLVLY	230	22911	IV MP	500	1	1329	IV-8022	102.4%	1335	-17	3346	IV 8022 50002 & BK81 CB
22020	AVOCADO	69	22508	MNSRATTP	69	1	52	Bus_MN69	102.1%	-53	1	444	Monserate 69kV S Bus
22771	BAY BLVD	230	22768	BAY BLVD	69	2	285	BB-1T	101.4%	276	85	719	BAYBLVD 230 kV 1T CB
22331	MIRASNTO	69	22644	PENSQTOS	69	1	136	662/6905	99.4%	-140	-17	1131	PQ-TP + PQ-GE
22504	MISSION	230	22496	MISSION	69	2	285	Bus_MS69S	98.6%	277	47	702	Mission 69kV S Bus
22771	BAY BLVD	230	22464	MIGUEL	230	1	1175	23022/23023	98.2%	-1158	0	2898	ML-MS 230 kV #1&#2
22440	MELROSE	69	22442	MELRSETP	69	1	102	69XX/69XY	98.0%	-100	-12	836	OR-SA CKT 1&2
22828	SYCAMORE	69	22756	SCRIPPS	69	1	154	Bus_MRGT69	98.0%	155	8	1263	Miramar1 (GT) 69kV Bus
22261	PEN	230	22716	SANLUSRY	230	1	593	23014/23015	95.7%	572	-28	1425	PEN-ES #1 + #2 230 kV
22596	OLD TOWN	230	22504	MISSION	230	1	456	23028/23029	95.2%	-423	105	1090	SG-OT 230kV #1+#2

Key Points:

The results of this alternative are nearly the same as the Proposed Project (ES-0), except that the OLD TOWN- MISSION 230 kV line is loaded to 95% and may need upgrades within 3-5 years beyond 2024. Note in the tables the level of overloads for single and double contingencies. The ES-3 alternative display a slightly improved (reduced number) number of overloads under single and double contingencies. This alternative is a likely candidate to compete with the Proposed Project from a transmission perspective and should be further evaluated for environmental impacts as compared to the Proposed Project.

Following in Figures 11, 12 and 13 are the associated sample power flow plots for 230/500 kV Normal conditions, 69/138 kV Normal conditions, and 69/138 kV (L-1, G-1) single contingency Border-Salt Creek + Miramar Unit 1, respectively.

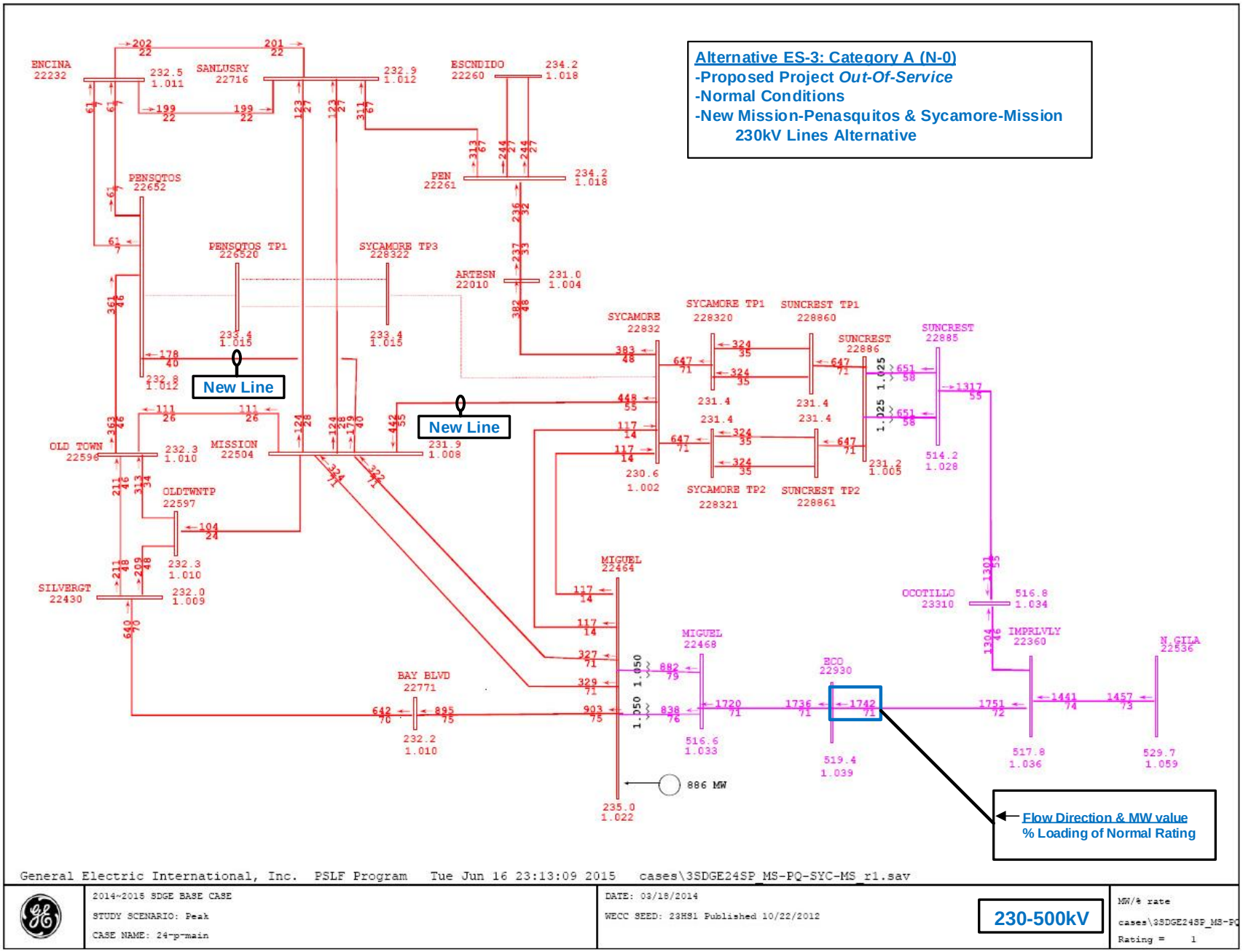


Figure 11 – ES-3, 230/500 kV Power Flow Plot, Normal conditions

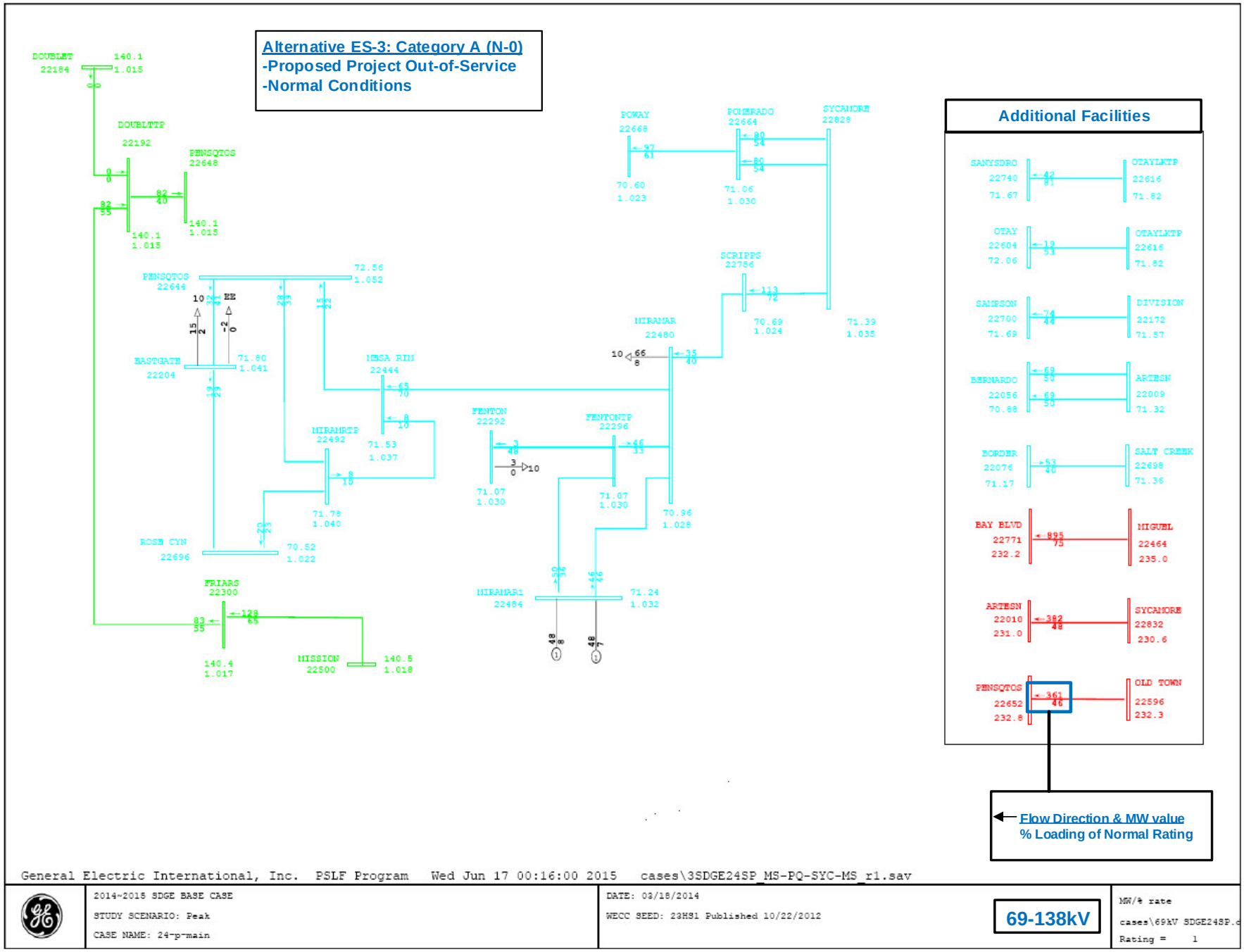


Figure 12 – ES-3, 69/138 kV Power Flow Plot, Normal conditions

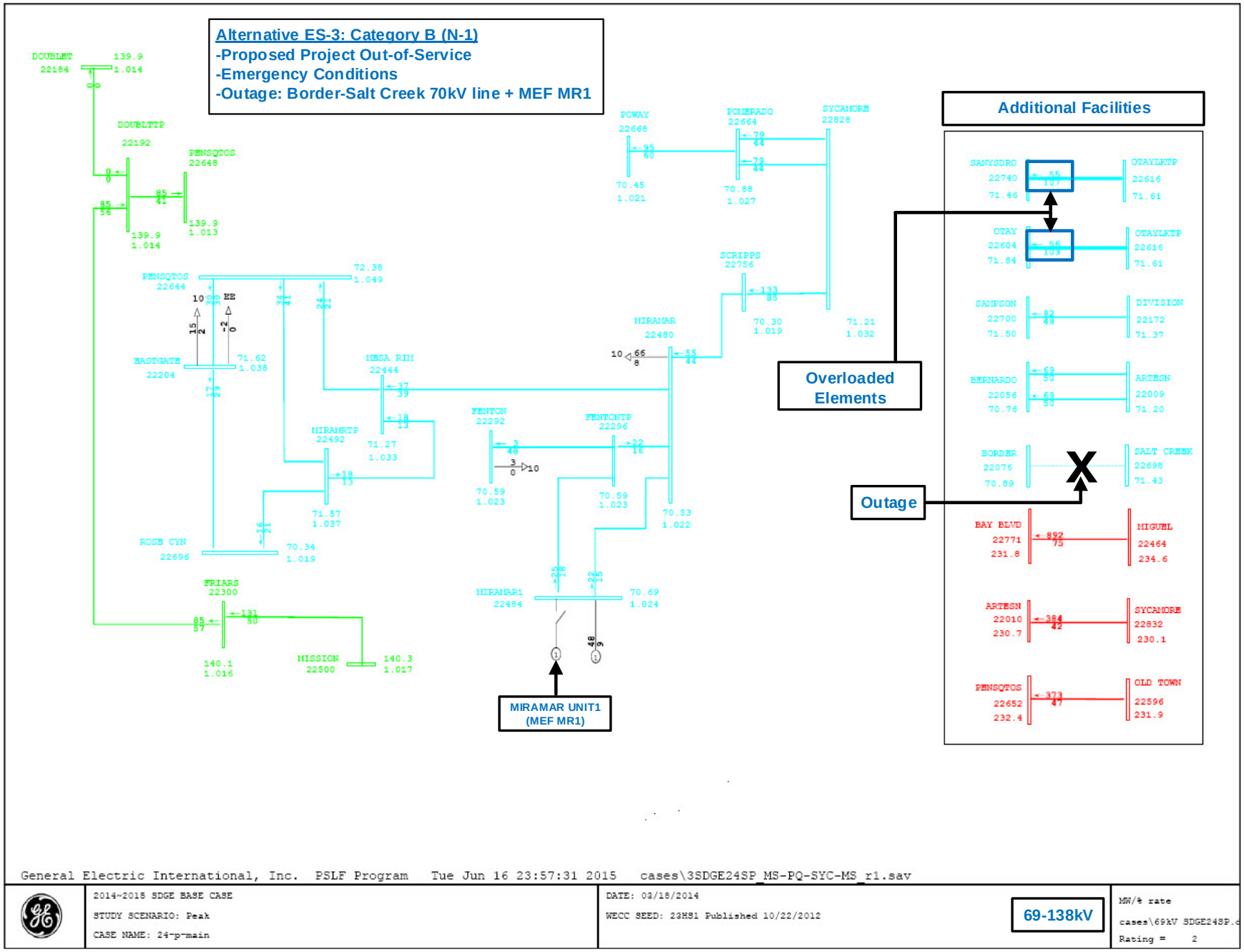


Figure 13 – ES-3, 69/138 kV Power Flow Plot, Single contingency

Alternative ES-4: Consists of ES-1 plus a Loop-in of a single Mission-SLR 230 kV Line into the Penasquitos Substation

Alternative ES-4: ES-1 + Loop-in of Single Mission-SLR 230 kV Line into Penasquitos Substation
SDG&E 2024 Reliability case
Single Contingency (Category B) Outages
Facilities loaded above 95% of Emergency Rating

Facility								Worst Outage	Loading				Worst Outage Description
From	Name	kV	To	Name	kV	ck	Rated MVA		%	MW	MVAR	AMPS	
22468	MIGUEL	500	22472	MIGUELMP	500	1	1329	T-5073	117.7%	1534	304	1742	22464 MIGUEL 230 22468 MIGUEL 500 2
22464	MIGUEL	230	22472	MIGUELMP	500	1	1329	T-5073	115.7%	-1532	-16	3788	22464 MIGUEL 230 22468 MIGUEL 500 2
22464	MIGUEL	230	22468	MIGUEL	500	2	1344	T-5075	115.0%	-1511	-11	3738	22468 MIGUEL 500 22472 MIGUELMP 500 1
22828	SYCAMORE	69	22756	SCRIPPS	69	1	154	70025	110.1%	172	8	1419	22771 BAY BLVD 230 22464 MIGUEL 230 1 + MEF MR1
22668	POWAY	69	22664	POMERADO	69	1	155	SL-5063	108.2%	-170	15	1403	22010 ARTESN 230 22832 SYCAMORE 230 1
22740	SANYSDRO	69	22616	OTAYLKTP	69	1	50	70035	107.3%	-55	5	448	22076 BORDER 69 22698 SALT CREEK 69 1 + MEF MR1
22604	OTAY	69	22616	OTAYLKTP	69	1	61	SL-1026	103.5%	-56	34	528	22076 BORDER 69 22698 SALT CREEK 69 1
22360	IMPRLVLY	500	22930	ECO	500	1	2598	SPS2-50286	99.0%	2589	367	2967	Line OCOTILLO-SUNCREST 500kV & Xtrip Only
22930	ECO	500	22468	MIGUEL	500	1	2598	SPS2-50286	98.9%	2562	42	2962	Line OCOTILLO-SUNCREST 500kV & Xtrip Only
22464	MIGUEL	230	22504	MISSION	230	1	605	70025	98.8%	603	45	1500	22771 BAY BLVD 230 22464 MIGUEL 230 1 + MEF MR1
22464	MIGUEL	230	22504	MISSION	230	2	605	70025	98.2%	600	42	1491	22771 BAY BLVD 230 22464 MIGUEL 230 1 + MEF MR1
228320	SYCAMORE TP1	230	22832	SYCAMORE	230	1	1183	SPS1-50285	97.0%	1117	43	2880	Line ECO-MIGUEL 500kV & Xtrip Only
228321	SYCAMORE TP2	230	22832	SYCAMORE	230	2	1183	SPS1-50285	97.0%	1117	43	2880	Line ECO-MIGUEL 500kV & Xtrip Only
22886	SUNCREST	230	228860	SUNCREST TP1	230	1	1183	SPS1-50285	96.9%	1122	21	2878	Line ECO-MIGUEL 500kV & Xtrip Only
22886	SUNCREST	230	228861	SUNCREST TP2	230	2	1183	SPS1-50285	96.9%	1122	21	2878	Line ECO-MIGUEL 500kV & Xtrip Only
22700	SAMPSON	69	22172	DIVISION	69	1	172	70026	96.6%	-166	40	1389	22430 SILVERGT 230 22771 BAY BLVD 230 1 + MEF MR1
22771	BAY BLVD	230	22464	MIGUEL	230	1	1175	70029	96.3%	-1135	19	2841	22464 MIGUEL 230 22504 MISSION 230 1 + MEF MR1
22056	BERNARDO	69	22009	ARTESN	69	1	137	70037	96.0%	-131	-26	1100	22056 BERNARDO 69 22009 ARTESN 69 2 + MEF MR1
22056	BERNARDO	69	22009	ARTESN	69	2	137	70036	96.0%	-131	-26	1100	22056 BERNARDO 69 22009 ARTESN 69 1 + MEF MR1

Alternative ES-4: ES-1 + Loop-in of Single Mission-SLR 230 kV Line into Penasquitos Substation
SDG&E 2024 Reliability case
Double Contingency (Category C) Outages
Facilities loaded above 95% of Emergency Rating

Facility								Worst Outage	Loading				Worst Outage Description
From	Name	kV	To	Name	kV	ck	Rated MVA		%	MW	MVAR	AMPS	
22668	POWAY	69	22664	POMERADO	69	1	155	23051/6920	128.2%	-201	20	1663	SX-AR 230 kV + SX-AR 69 kV
22306	GARFIELD	69	22208	EL CAJON	69	1	102	Bus_MS69S	127.8%	-130	-19	1091	Mission 69kV S Bus
22468	MIGUEL	500	22472	MIGUELMP	500	1	1329	ML-2T	118.2%	1542	296	1747	MIGUEL 230 kV 2T CB
22740	SANYSDRO	69	22616	OTAYLKTP	69	1	50	Bus_OY69E	117.1%	-59	9	488	Otay 69kV E Bus
22464	MIGUEL	230	22472	MIGUELMP	500	1	1329	ML-2T	116.2%	-1539	-7	3799	MIGUEL 230 kV 2T CB
22856	TOREYPNS	69	22200	DUNHILTP	69	1	126	662/6905	115.6%	-149	-21	1218	PQ-TP + PQ-GE
22771	BAY BLVD	230	22464	MIGUEL	230	1	1175	23022/23023	114.8%	-1347	44	3386	ML-MS 230 kV #1&#2
22356	IMPRLVLY	230	22360	IMPRLVLY	500	2	732	IV-8022	114.0%	820	-10	2054	IV 8022 50002 & BK81 CB
22609	OTAYMESA	230	20149	TJI-230	230	1	796	23041B/42B	113.9%	890	162	2274	OMGP-ML #1+#2 230 kV
22420	SILVERGT	69	22868	URBAN	69	1	100	655/699	109.4%	104	46	913	SG-CR + SG-B
22261	PEN	230	22716	SANLUSRY	230	1	593	23014/23015	109.1%	650	-33	1624	PEN-ES #1 + #2 230 kV
22532	MURRAY	69	22306	GARFIELD	69	1	97	Bus_MS69S	109.0%	-105	-13	885	Mission 69kV S Bus
22188	DOUBLTTP	69	22164	DELMARTP	69	1	136	662/6905	108.9%	-152	-24	1239	PQ-TP + PQ-GE
22200	DUNHILTP	69	22188	DOUBLTTP	69	1	136	662/6905	108.9%	-152	-23	1239	PQ-TP + PQ-GE
22644	PENSQTOS	69	22164	DELMARTP	69	1	136	662/6905	108.9%	153	28	1238	PQ-TP + PQ-GE
22828	SYCAMORE	69	22756	SCRIPPS	69	1	154	Bus_MRGT69	107.9%	170	8	1391	Miramar1 (GT) 69kV Bus
22464	MIGUEL	230	22504	MISSION	230	1	605	13815/23042	107.5%	656	57	1633	BB-ML & GRNTHIL-SY
22771	BAY BLVD	230	22768	BAY BLVD	69	2	285	BB-1T	107.3%	293	88	764	BAYBLVD 230 kV 1T CB
22464	MIGUEL	230	22504	MISSION	230	2	605	13815/23042	106.9%	653	54	1624	BB-ML & GRNTHIL-SY
22020	AVOCADO	69	22508	MNSRATTP	69	1	52	Bus_MN69	105.5%	-55	2	459	Monserate 69kV S Bus
22400	LASPULGS	69	22368	JAP MESA	69	1	32	23007OH2/52	105.0%	33	-8	281	SMESA-TA+SMESA-CAP 230
22056	BERNARDO	69	22284	FELCTATP	69	1	102	23014/23015	102.8%	105	-19	878	PEN-ES #1 + #2 230 kV
22360	IMPRLVLY	500	22911	IV MP	500	1	1329	IV-8022	101.8%	-1325	268	1512	IV 8022 50002 & BK81 CB
22356	IMPRLVLY	230	22911	IV MP	500	1	1329	IV-8022	101.8%	1328	-14	3327	IV 8022 50002 & BK81 CB
22331	MIRASNTO	69	22644	PENSQTOS	69	1	136	662/6905	99.4%	-140	-17	1132	PQ-TP + PQ-GE
22476	MIGUELTP	69	22456	MIGUEL	69	1	136	13815/23042	99.1%	-136	12	1127	BB-ML & GRNTHIL-SY
22440	MELROSE	69	22442	MELRSETP	69	1	102	69XX/69XY	97.9%	-100	-12	836	OR-SA CKT 1&2
22664	POMERADO	69	22828	SYCAMORE	69	2	174	Bus_SX69S	97.7%	-173	-9	1422	Sycamore 69kV S Bus
22444	MESA RIM	69	22480	MIRAMAR	69	1	114	13815/23042	96.6%	-106	36	921	BB-ML & GRNTHIL-SY
22504	MISSION	230	22496	MISSION	69	2	285	Bus_MS69S	95.9%	269	46	683	Mission 69kV S Bus

Key Points:

This scenario does not show any significant improvement in relieving 500 kV, 230 kV and 69 kV overloads. The results are similar to the ES-1 No Project alternative. This Alternative may be rejected. Sample power flow plots Figures 14, 15 and 16 follow.

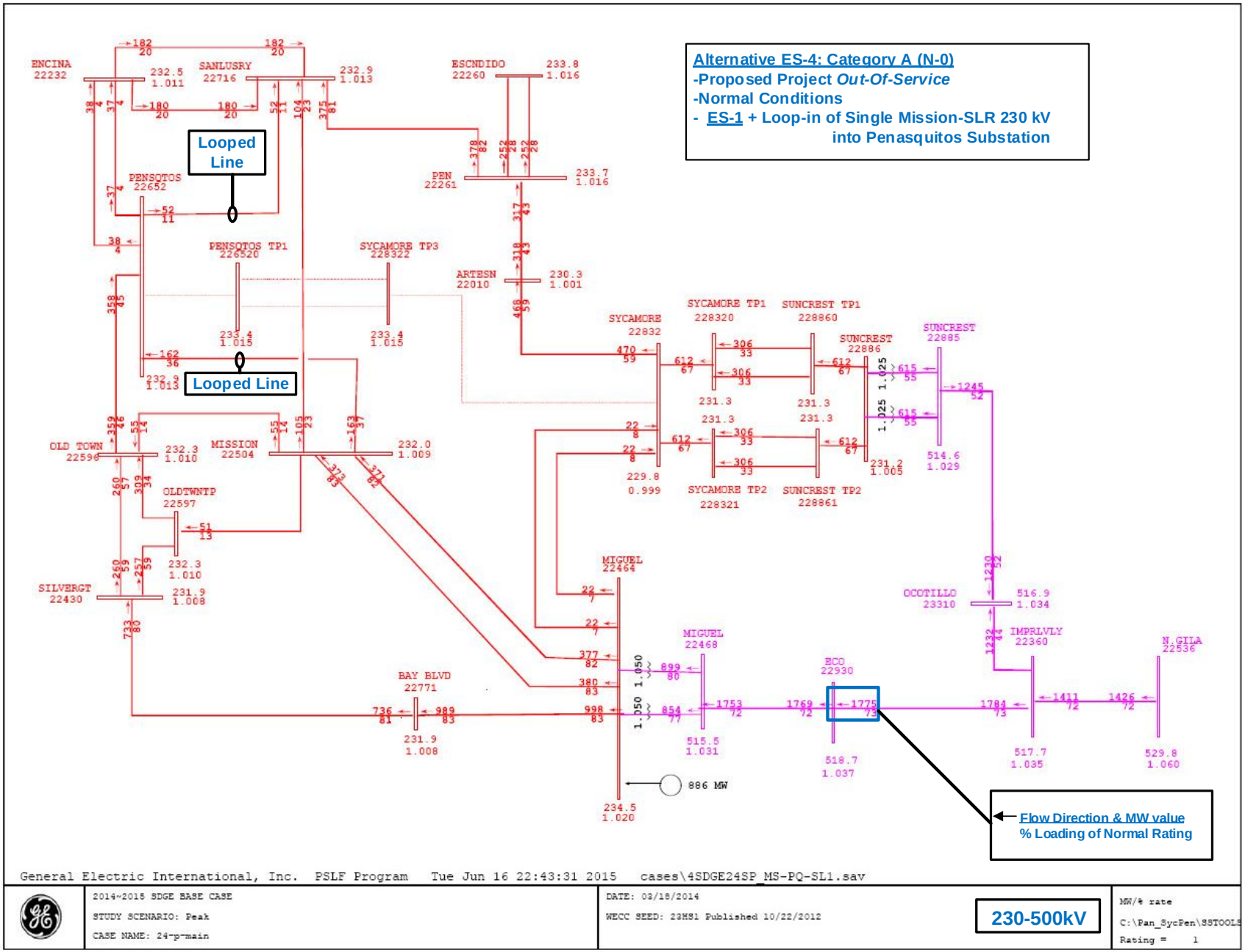


Figure 14 – ES-4, 230/500 kV Power Flow Plot, Normal conditions

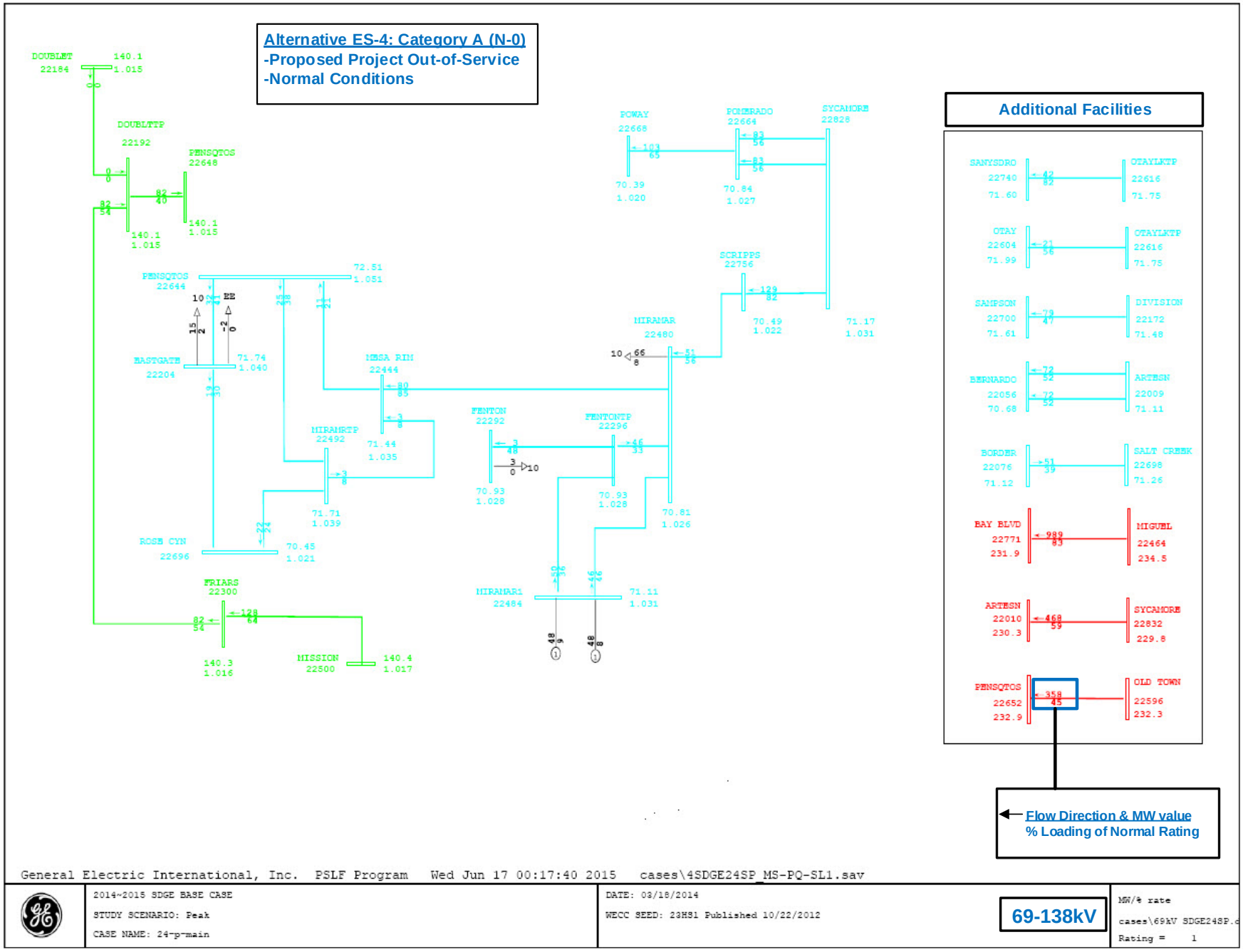


Figure 15 – ES-4, 69/138 kV Power Flow Plot, Normal conditions

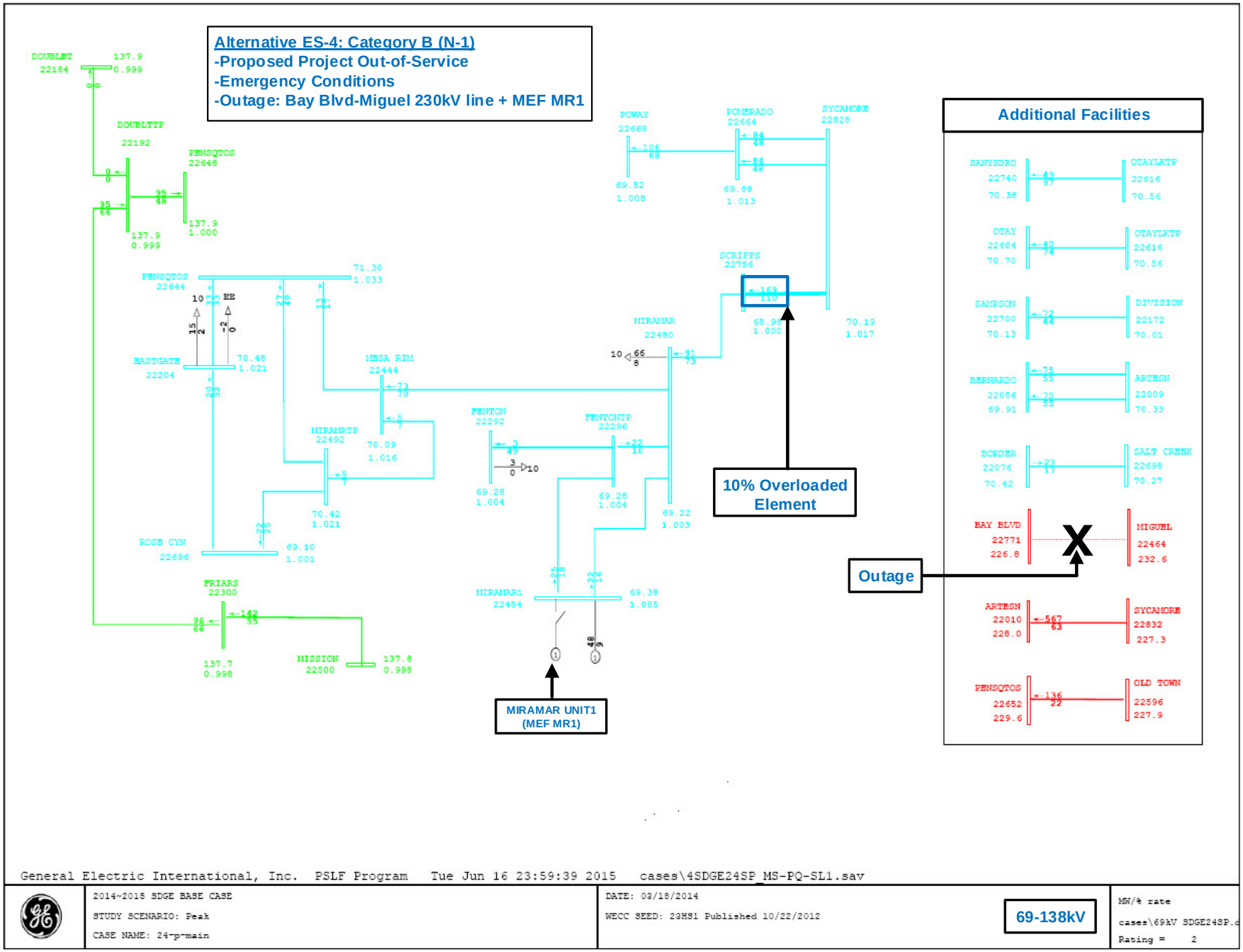


Figure 15 – ES-4, 69/138 kV Power Flow Plot, Single contingency

Alternative ES-5: Consists of ES-1 plus a Loop-in of both Mission-SLR 230 kV Lines into the Penasquitos Substation

Alternative ES-5: ES-1 + Loop-in of Both Mission-SLR 230 kV Lines into Penasquitos Substation

SDG&E 2024 Reliability case

Single Contingency (Category B) Outages

Facilities loaded above 95% of Emergency Rating

Facility								Worst Outage	Loading				Worst Outage description
From	Name	kV	To	Name	kV	ck	Rated Mva		%	MW	MVAR	AMPS	
22468	MIGUEL	500	22472	MIGUELMP	500	1	1329	T-5073	117.8%	1536	304	1743	22464 MIGUEL 230 22468 MIGUEL 500 2
22464	MIGUEL	230	22472	MIGUELMP	500	1	1329	T-5073	115.7%	-1533	-16	3790	22464 MIGUEL 230 22468 MIGUEL 500 2
22464	MIGUEL	230	22468	MIGUEL	500	2	1344	T-5074	115.0%	-1512	-11	3741	22464 MIGUEL 230 22472 MIGUELMP 500 1
22828	SYCAMORE	69	22756	SCRIPPS	69	1	154	70025	108.9%	171	8	1404	22771 BAY BLVD 230 22464 MIGUEL 230 1 + MEF MR1
22668	POWAY	69	22664	POMERADO	69	1	155	SL-5063	108.0%	-169	14	1401	22010 ARTESN 230 22832 SYCAMORE 230 1
22740	SANYSDRO	69	22616	OTAYLKTP	69	1	50	70035	107.3%	-55	5	448	22076 BORDER 69 22698 SALT CREEK 69 1 + MEF MR1
22604	OTAY	69	22616	OTAYLKTP	69	1	61	SL-1026	103.6%	-56	34	528	22076 BORDER 69 22698 SALT CREEK 69 1
22464	MIGUEL	230	22504	MISSION	230	1	605	70025	99.3%	606	44	1508	22771 BAY BLVD 230 22464 MIGUEL 230 1 + MEF MR1
22360	IMPRLVLY	500	22930	ECO	500	1	2598	SPS2-50286	99.1%	2590	367	2969	Line OCOTILLO-SUNCREST 500kV & Xtrip Only
22930	ECO	500	22468	MIGUEL	500	1	2598	SPS2-50286	98.9%	2563	41	2964	Line OCOTILLO-SUNCREST 500kV & Xtrip Only
22464	MIGUEL	230	22504	MISSION	230	2	605	70025	98.7%	603	42	1499	22771 BAY BLVD 230 22464 MIGUEL 230 1 + MEF MR1
228320	SYCAMORE TP1	230	22832	SYCAMORE	230	1	1183	SPS1-50285	97.0%	1117	42	2881	Line ECO-MIGUEL 500kV & Xtrip Only
228321	SYCAMORE TP2	230	22832	SYCAMORE	230	2	1183	SPS1-50285	97.0%	1117	42	2881	Line ECO-MIGUEL 500kV & Xtrip Only
22886	SUNCREST	230	228860	SUNCREST TP1	230	1	1183	SPS1-50285	96.9%	1123	21	2879	Line ECO-MIGUEL 500kV & Xtrip Only
22886	SUNCREST	230	228861	SUNCREST TP2	230	2	1183	SPS1-50285	96.9%	1123	21	2879	Line ECO-MIGUEL 500kV & Xtrip Only
22771	BAY BLVD	230	22464	MIGUEL	230	1	1175	70029	96.2%	-1134	19	2838	22464 MIGUEL 230 22504 MISSION 230 1 + MEF MR1
22700	SAMPSON	69	22172	DIVISION	69	1	172	70026	96.2%	-165	40	1385	22430 SILVERGT 230 22771 BAY BLVD 230 1 + MEF MR1
22056	BERNARDO	69	22009	ARTESN	69	1	137	70037	95.9%	-131	-26	1099	22056 BERNARDO 69 22009 ARTESN 69 2 + MEF MR1
22056	BERNARDO	69	22009	ARTESN	69	2	137	70036	95.9%	-131	-26	1099	22056 BERNARDO 69 22009 ARTESN 69 1 + MEF MR1
22627	PA GEN	69	22624	PALA	69	1	102	base	94.3%	99	8	805	Base system (n-0)

Alternative ES-5: ES-1 + Loop-in of Both Mission-SLR 230 kV Lines into Penasquitos Substation

SDG&E 2024 Reliability case

Double Contingency (Category C) Outages

Facilities loaded above 95% of Emergency

Facility								Worst Outage	Loading				Worst Outage description
From	Name	kV	To	Name	kV	ck	Rated Mva		%	MW	MVAR	AMPS	
22668	POWAY	69	22664	POMERADO	69	1	155	23051/6920	128.1%	-200	20	1661	SX-AR 230 kV + SX-AR 69 kV
22306	GARFIELD	69	22208	EL CAJON	69	1	102	Bus_MS69S	127.8%	-130	-19	1091	Mission 69kV S Bus
22468	MIGUEL	500	22472	MIGUELMP	500	1	1329	ML-2T	118.3%	1544	296	1749	MIGUEL 230 kV 2T CB
22740	SANYSDRO	69	22616	OTAYLKTP	69	1	50	Bus_OY69E	117.0%	-59	9	488	Otay 69kV E Bus
22464	MIGUEL	230	22472	MIGUELMP	500	1	1329	ML-2T	116.3%	-1541	-6	3802	MIGUEL 230 kV 2T CB
22856	TOREYPNS	69	22200	DUNHILTP	69	1	126	662/6905	115.6%	-149	-21	1219	PQ-TP + PQ-GE
22771	BAY BLVD	230	22464	MIGUEL	230	1	1175	23022/23023	114.8%	-1347	45	3386	ML-MS 230 kV #1&#2
22356	IMPRLVLY	230	22360	IMPRLVLY	500	2	732	IV-8022	114.1%	820	-10	2055	IV 8022 50002 & BK81 CB
22609	OTAYMESA	230	20149	TJI-230	230	1	796	23041B/42B	113.8%	890	162	2274	OMGP-ML #1+#2 230 kV
22420	SILVERGT	69	22868	URBAN	69	1	100	655/699	109.3%	103	46	912	SG-CR + SG-B
22532	MURRAY	69	22306	GARFIELD	69	1	97	Bus_MS69S	109.1%	-105	-13	885	Mission 69kV S Bus
22261	PEN	230	22716	SANLUSRY	230	1	593	23014/23015	109.0%	649	-34	1622	PEN-ES #1 + #2 230 kV
22188	DOUBLTTP	69	22164	DELMARTP	69	1	136	662/6905	108.9%	-152	-24	1239	PQ-TP + PQ-GE
22200	DUNHILTP	69	22188	DOUBLTTP	69	1	136	662/6905	108.9%	-152	-23	1239	PQ-TP + PQ-GE
22644	PENSQTOS	69	22164	DELMARTP	69	1	136	662/6905	108.9%	153	28	1238	PQ-TP + PQ-GE
22464	MIGUEL	230	22504	MISSION	230	1	605	13815/23042	108.1%	660	57	1641	BB-ML & GRNTHIL-SY
22464	MIGUEL	230	22504	MISSION	230	2	605	13815/23042	107.5%	656	54	1632	BB-ML & GRNTHIL-SY
22771	BAY BLVD	230	22768	BAY BLVD	69	2	285	BB-1T	107.1%	292	88	763	BAYBLVD 230 kV 1T CB
22828	SYCAMORE	69	22756	SCRIPPS	69	1	154	Bus_MRGT69	107.0%	169	8	1379	Miramar1 (GT) 69kV Bus
22020	AVOCADO	69	22508	MNSRATTP	69	1	52	Bus_MN69	105.4%	-55	2	459	Monserate 69kV S Bus
22400	LASPULGS	69	22368	JAP MESA	69	1	32	23007OH2/52	105.0%	33	-8	281	SMESA-TA+SMESA-CAP 230
22056	BERNARDO	69	22284	FELCTATP	69	1	102	23014/23015	102.6%	105	-19	876	PEN-ES #1 + #2 230 kV
22360	IMPRLVLY	500	22911	IV MP	500	1	1329	IV-8022	101.8%	-1325	269	1513	IV 8022 50002 & BK81 CB
22356	IMPRLVLY	230	22911	IV MP	500	1	1329	IV-8022	101.8%	1328	-14	3329	IV 8022 50002 & BK81 CB
22331	MIRASNTO	69	22644	PENSQTOS	69	1	136	662/6905	99.5%	-140	-17	1132	PQ-TP + PQ-GE
22476	MIGUELTP	69	22456	MIGUEL	69	1	136	13815/23042	98.9%	-136	12	1125	BB-ML & GRNTHIL-SY
22440	MELROSE	69	22442	MELRSETP	69	1	102	69XX/69XY	97.9%	-100	-12	836	OR-SA CKT 1&2
22664	POMERADO	69	22828	SYCAMORE	69	2	174	Bus_SX69S	97.7%	-173	-9	1422	Sycamore 69kV S Bus
22504	MISSION	230	22496	MISSION	69	2	285	Bus_MS69S	95.2%	267	46	678	Mission 69kV S Bus
22444	MESA RIM	69	22480	MIRAMAR	69	1	114	13815/23042	95.1%	-105	35	906	BB-ML & GRNTHIL-SY

Key Points:

This Alternative does not show any significant improvement in relieving 500 kV, 230 kV and 69 kV overloads. The results are similar to the **ES-1 No Project** alternative. **This Alternative may be rejected**.

Sample power flow plots Figures 16 and 17 follow.

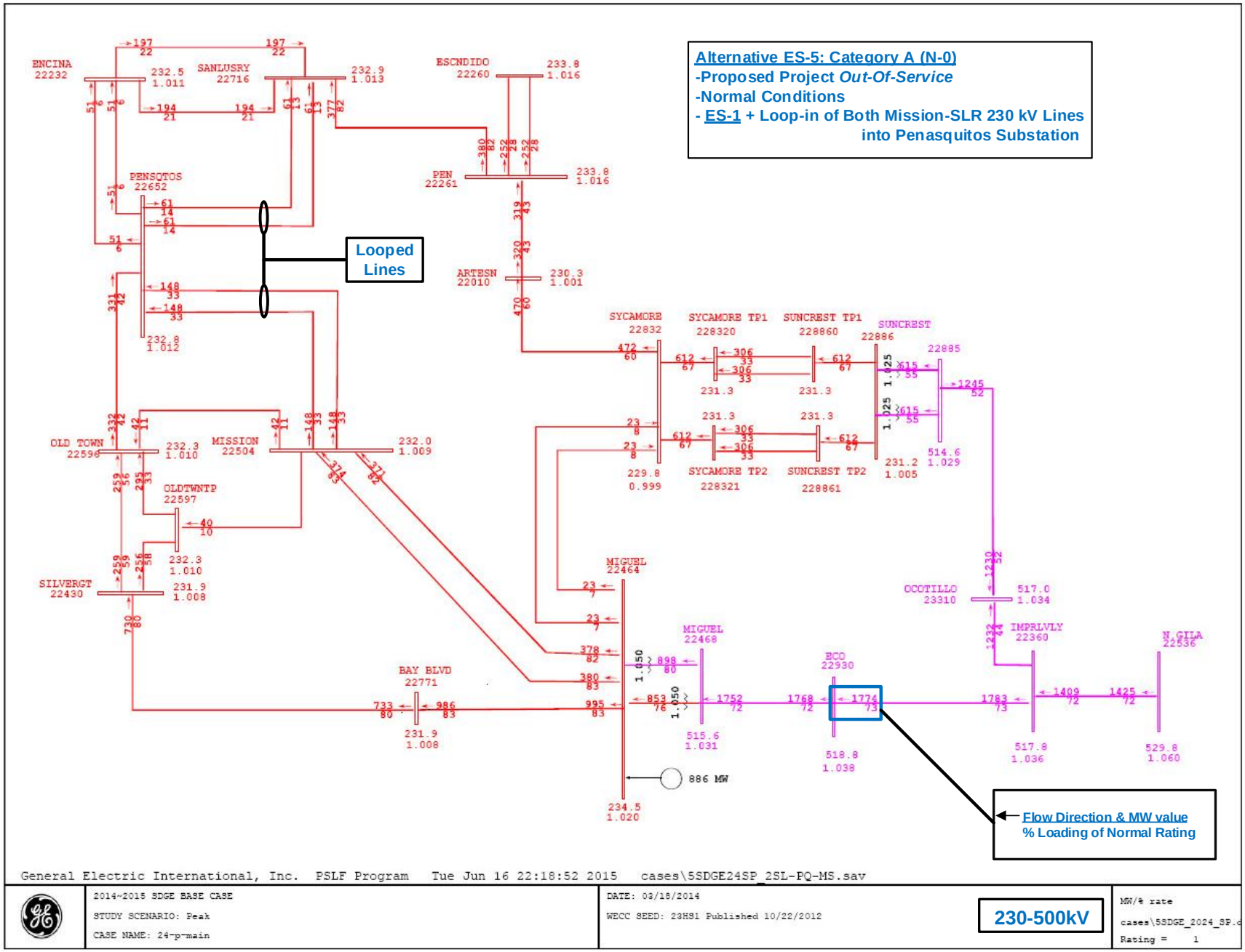


Figure 16 – ES-5, 230/500 kV Power Flow Plot, Normal condition

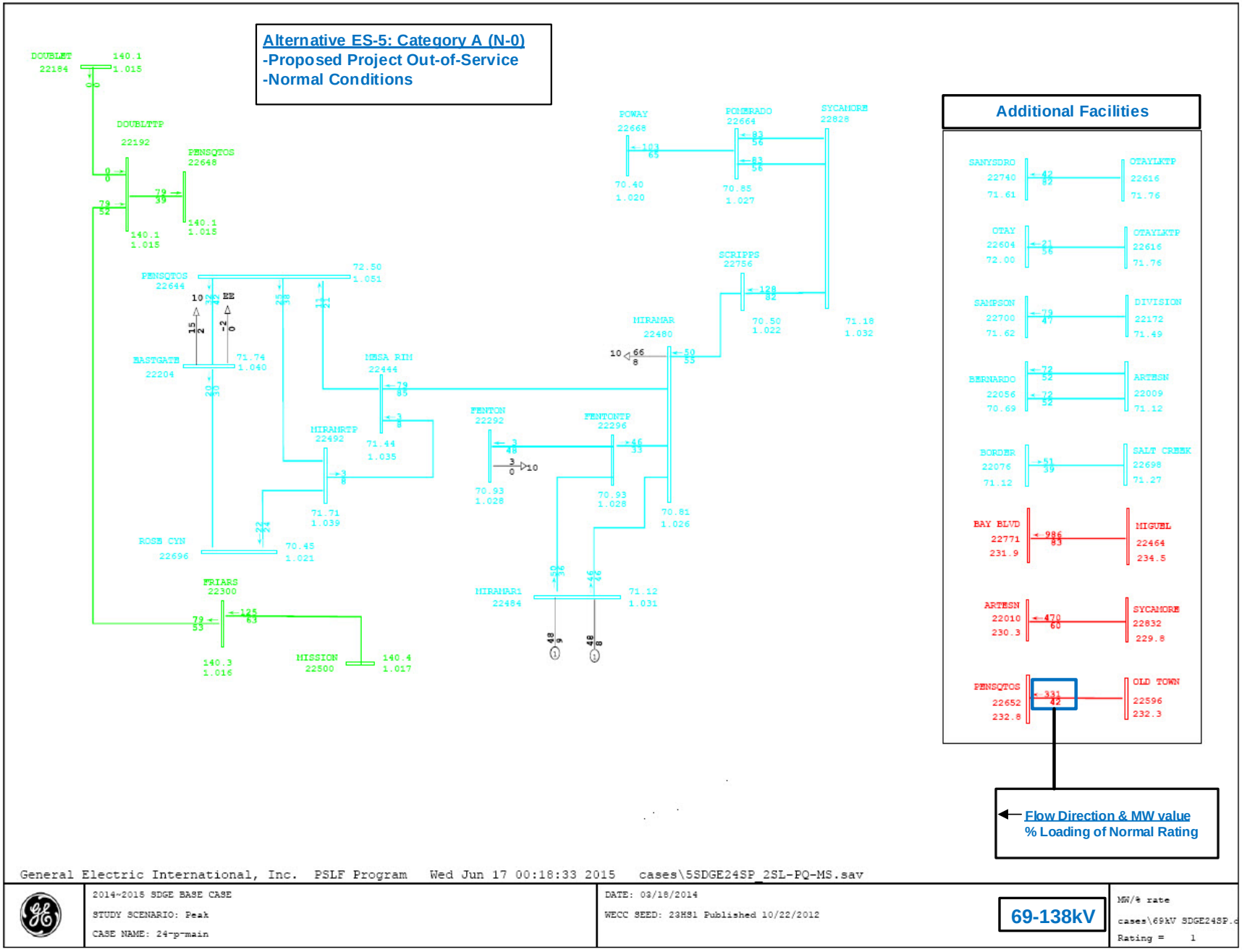


Figure 17 – ES-5, 69/138 kV Power Flow Plot, Normal condition

Alternative ES-6: Consists of ES-1 plus the New Mission - Penasquitos 230 kV line plus reconductor Poway-Pomerado 69 kV line plus series reactor on the Scripps-Miramar 69 kV line

Alternative ES-6: ES-1 + New Mission-Penasquitos 230 kV Line + Reconductor Poway-Pomerado 69 kV Line + Series Reactor on Scripps-Miramar 69 kV Line
SDG&E 2024 Reliability case
Single Contingency (Category B) Outages
Facilities loaded above 95% of Emergency Rating

Facility								Worst Outage	Loading				Worst Outage Description
From	Name	kV	To	Name	kV	ck	Rated MVA		%	MW	MVAR	AMPS	
22468	MIGUEL	500	22472	MIGUELMP	500	1	1329	T-5073	118.1%	1540	303	1748	22464 MIGUEL 230 22468 MIGUEL 500 2
22464	MIGUEL	230	22472	MIGUELMP	500	1	1329	T-5073	116.0%	-1537	-13	3801	22464 MIGUEL 230 22468 MIGUEL 500 2
22464	MIGUEL	230	22468	MIGUEL	500	2	1344	T-5074	115.3%	-1516	-8	3751	22464 MIGUEL 230 22472 MIGUELMP 500 1
22740	SANYSDRO	69	22616	OTAYLKTP	69	1	50	70035	107.3%	-55	5	448	22076 BORDER 69 22698 SALT CREEK 69 1 + MEF MR1
22604	OTAY	69	22616	OTAYLKTP	69	1	61	SL-1026	103.6%	-56	34	528	22076 BORDER 69 22698 SALT CREEK 69 1
22464	MIGUEL	230	22504	MISSION	230	1	605	70025	100.0%	611	43	1519	22771 BAY BLVD 230 22464 MIGUEL 230 1 + MEF MR1
22464	MIGUEL	230	22504	MISSION	230	2	605	70025	99.5%	608	41	1511	22771 BAY BLVD 230 22464 MIGUEL 230 1 + MEF MR1
22360	IMPRLVLY	500	22930	ECO	500	1	2598	SPS2-50286	99.2%	2594	368	2973	Line OCOTILLO-SUNCREST 500kV & Xtrip Only
22930	ECO	500	22468	MIGUEL	500	1	2598	SPS2-50286	99.1%	2567	40	2969	Line OCOTILLO-SUNCREST 500kV & Xtrip Only
22700	SAMPSON	69	22172	DIVISION	69	1	172	70026	97.5%	-167	40	1403	22430 SILVERGT 230 22771 BAY BLVD 230 1 + MEF MR1
22771	BAY BLVD	230	22464	MIGUEL	230	1	1175	70029	97.1%	-1144	23	2863	22464 MIGUEL 230 22504 MISSION 230 1 + MEF MR1
228320	SYCAMORE TP1	230	22832	SYCAMORE	230	1	1183	SPS1-50285	96.9%	1116	43	2878	Line ECO-MIGUEL 500kV & Xtrip Only
228321	SYCAMORE TP2	230	22832	SYCAMORE	230	2	1183	SPS1-50285	96.9%	1116	43	2878	Line ECO-MIGUEL 500kV & Xtrip Only
22886	SUNCREST	230	228860	SUNCREST TP1	230	1	1183	SPS1-50285	96.8%	1121	22	2875	Line ECO-MIGUEL 500kV & Xtrip Only
22886	SUNCREST	230	228861	SUNCREST TP2	230	2	1183	SPS1-50285	96.8%	1121	22	2875	Line ECO-MIGUEL 500kV & Xtrip Only
22056	BERNARDO	69	22009	ARTESN	69	1	137	70037	95.7%	-131	-26	1097	22056 BERNARDO 69 22009 ARTESN 69 2 + MEF MR1
22056	BERNARDO	69	22009	ARTESN	69	2	137	70036	95.7%	-131	-26	1097	22056 BERNARDO 69 22009 ARTESN 69 1 + MEF MR1

Alternative ES-6: ES-1 + New Mission-Penasquitos 230 kV Line + Reconductor Poway-Pomerado 69 kV Line + Series Reactor on Scripps-Miramar 69 kV Line
SDG&E 2024 Reliability case
Double Contingency (Category C) Outages
Facilities loaded above 95% of Emergency Rating

Facility								Worst Outage	Loading				Worst Outage Description
From	Name	kV	To	Name	kV	ck	Rated MVA		%	MW	MVAR	AMPS	
22306	GARFIELD	69	22208	EL CAJON	69	1	102	Bus_MS69S	128.6%	-131	-18	1097	Mission 69kV S Bus
22468	MIGUEL	500	22472	MIGUELMP	500	1	1329	ML-2T	118.6%	1549	295	1754	MIGUEL 230 kV 2T CB
22740	SANYSDRO	69	22616	OTAYLKTP	69	1	50	Bus_OY69E	117.3%	-59	9	489	Otay 69kV E Bus
22464	MIGUEL	230	22472	MIGUELMP	500	1	1329	ML-2T	116.7%	-1546	-4	3814	MIGUEL 230 kV 2T CB
22771	BAY BLVD	230	22464	MIGUEL	230	1	1175	23022/23023	115.5%	-1356	49	3408	ML-MS 230 kV #1&#2
22856	TOREYPNS	69	22200	DUNHILTP	69	1	126	662/6905	115.4%	-149	-21	1217	PQ-TP + PQ-GE
22356	IMPRLVLY	230	22360	IMPRLVLY	500	2	732	IV-8022	114.1%	820	-9	2056	IV 8022 50002 & BK81 CB
22609	OTAYMESA	230	20149	TJI-230	230	1	796	23041B/42B	114.0%	891	163	2277	OMGP-ML #1+#2 230 kV
22532	MURRAY	69	22306	GARFIELD	69	1	97	Bus_MS69S	109.9%	-106	-12	892	Mission 69kV S Bus
22420	SILVERGT	69	22868	URBAN	69	1	100	655/699	109.5%	104	46	914	SG-CR + SG-B
22188	DOUBLTTP	69	22164	DELMARTP	69	1	136	662/6905	108.8%	-152	-24	1238	PQ-TP + PQ-GE
22200	DUNHILTP	69	22188	DOUBLTTP	69	1	136	662/6905	108.8%	-152	-23	1238	PQ-TP + PQ-GE
22464	MIGUEL	230	22504	MISSION	230	1	605	13815/23042	108.8%	664	55	1652	BB-ML & GRNTHIL-SY
22644	PENSQTOS	69	22164	DELMARTP	69	1	136	662/6905	108.8%	153	28	1237	PQ-TP + PQ-GE
22261	PEN	230	22716	SANLUSRY	230	1	593	23014/23015	108.4%	646	-33	1614	PEN-ES #1 + #2 230 kV
22464	MIGUEL	230	22504	MISSION	230	2	605	13815/23042	108.2%	661	52	1643	BB-ML & GRNTHIL-SY
22771	BAY BLVD	230	22768	BAY BLVD	69	2	285	BB-1T	107.7%	294	88	767	BAYBLVD 230 kV 1T CB
22020	AVOCADO	69	22508	MNSRATTP	69	1	52	Bus_MN69	105.3%	-55	1	458	Monserate 69kV S Bus
22400	LASPULGS	69	22368	JAP MESA	69	1	32	23007OH2/52	105.1%	33	-8	282	SMESA-TA+SMESA-CAP 230
22056	BERNARDO	69	22284	FELCTATP	69	1	102	23014/23015	102.9%	105	-19	878	PEN-ES #1 + #2 230 kV
22360	IMPRLVLY	500	22911	IV MP	500	1	1329	IV-8022	101.8%	-1325	268	1513	IV 8022 50002 & BK81 CB
22356	IMPRLVLY	230	22911	IV MP	500	1	1329	IV-8022	101.8%	1328	-13	3329	IV 8022 50002 & BK81 CB
22476	MIGUELTP	69	22456	MIGUEL	69	1	136	13815/23042	99.7%	-137	12	1134	BB-ML & GRNTHIL-SY
22331	MIRASNTO	69	22644	PENSQTOS	69	1	136	662/6905	99.3%	-140	-17	1130	PQ-TP + PQ-GE
22664	POMERADO	69	22828	SYCAMORE	69	2	174	Bus_SX69S	98.9%	-175	-8	1440	Sycamore 69kV S Bus
22440	MELROSE	69	22442	MELRSETP	69	1	102	69XX/69XY	98.0%	-100	-12	836	OR-SA CKT 1&2
22504	MISSION	230	22496	MISSION	69	2	285	Bus_MS69S	95.7%	269	46	681	Mission 69kV S Bus

Key Points:

1. This alternative was evaluated at the request of Panorama / CPUC. The results show elimination of the overload on two (2) 69 kV lines; the Sycamore-Scripps and Poway-Pomerado 69 kV lines.
2. The results show one Miguel-Mission 230 kV line loaded to 100% and the other loaded to 99.5%. Both these circuits will require mitigation.
3. Several 230 kV and 69 kV circuits are loaded above 95% and may need mitigation within 3-5 years beyond 2024.
4. If compared with the Proposed Project, Alternative ES-0, this project does not show any technical advantage. The Proposed Project provides the same relief of overloads as in item 1, it avoids the overloads in item 2, and eliminates heavily loaded circuits in item 3.
5. This alternative does not effectively address the relief of the gateway (Sycamore substation) to allow increased delivery of renewable energy, nor does it provide the necessary increase in energy flow to the load center at Penasquitos.
6. **This Alternative is not recommended.**

Sample power flow plots, Figures 18, 19 and 20 follow.

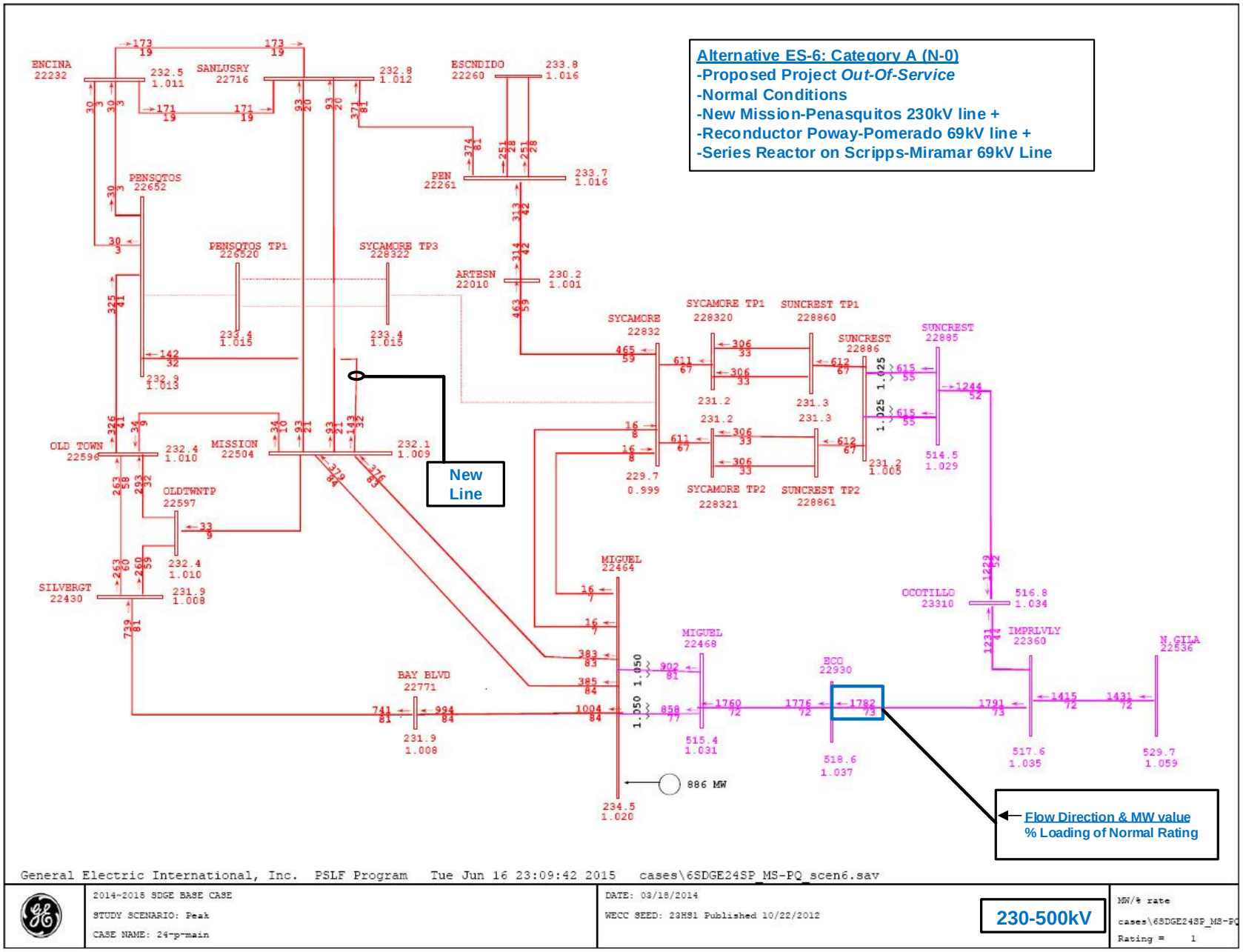


Figure 18 – ES-6, 230/500 kV Power Flow Plot, Normal condition

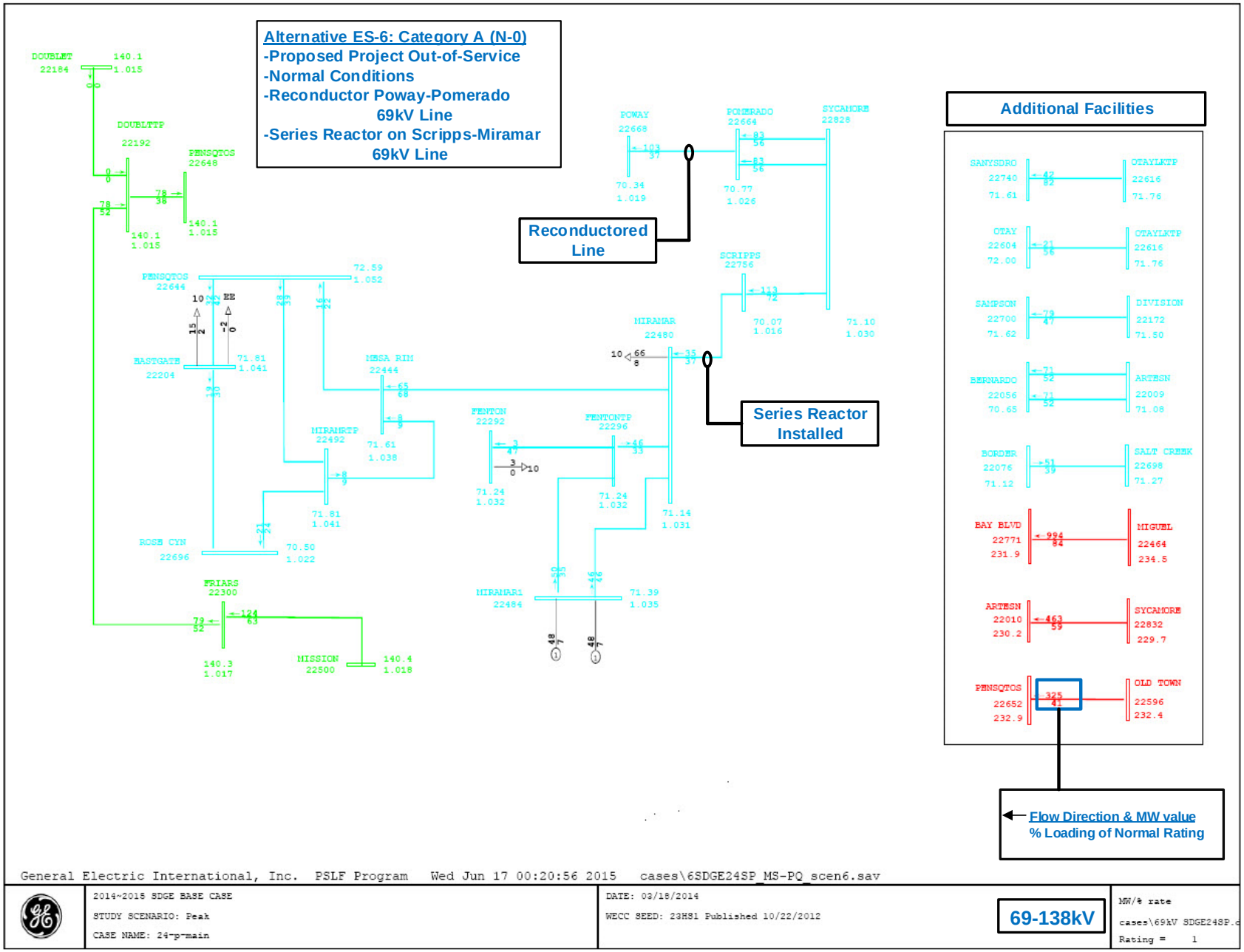


Figure 19 – ES-6, 69/138 kV Power Flow Plot, Normal condition

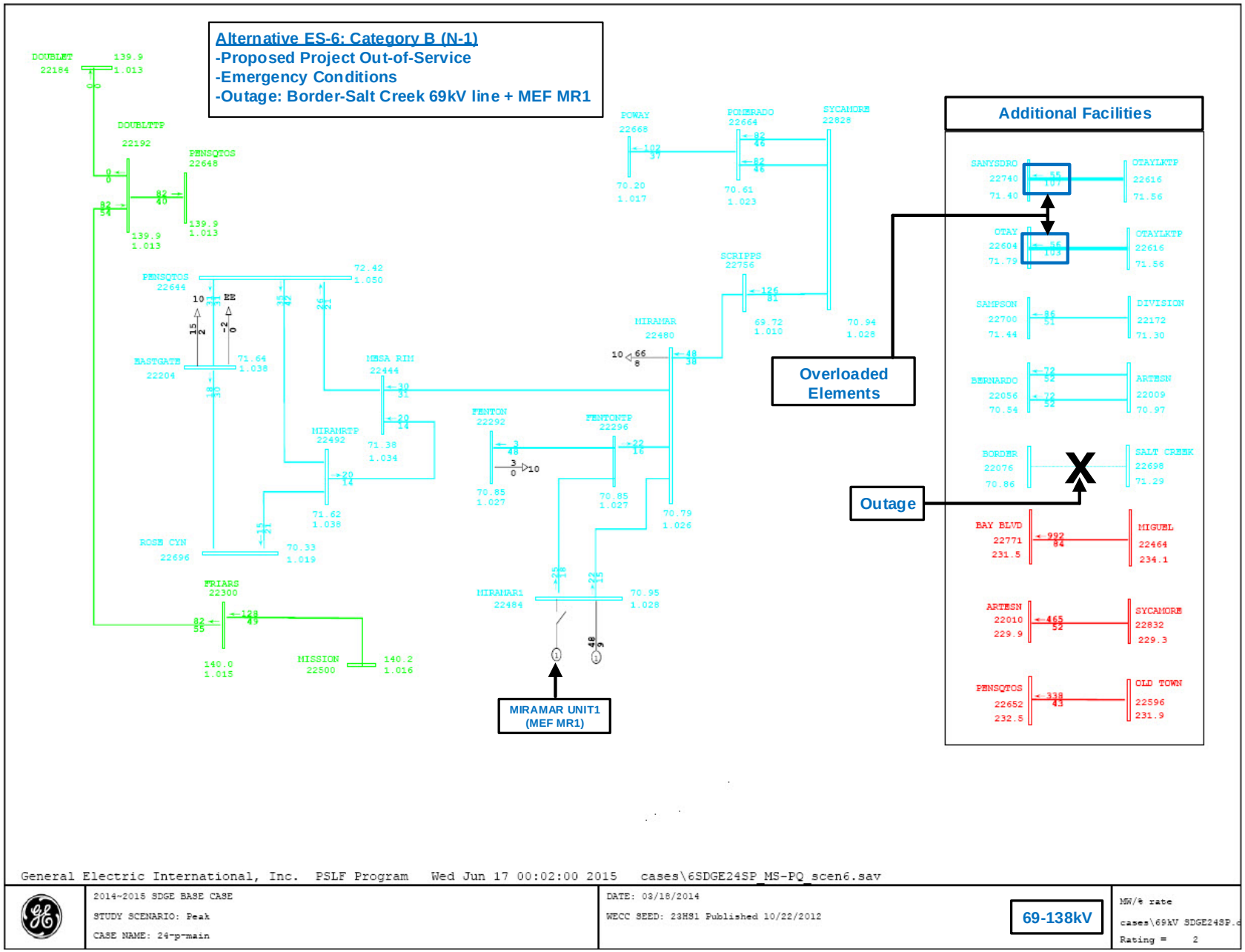


Figure 20 – ES-6, 69/138 kV Power Flow Plot, Single contingency

Alternative ES-7: Consists of ES-1 plus New Sycamore-Mission230 kV Line plus Loop-in of one (1) Mission-SLR 230 kV Line into Penasquitos Substation

Alternative ES-7: Consists of ES-1 + New Sycamore-Mission230 kV Line + Loop-in of One Mission-SLR 230 kV Line into Penasquitos Substation
SDG&E 2024 Reliability case
Single Contingency (Category B) Outages
Facilities loaded above 95% of Emergency Rating

Facility								Worst Outage	Loading				Worst Outage Description
From	Name	kV	To	Name	kV	ck	Rated MVA		%	MW	MVAR	AMPS	
22468	MIGUEL	500	22472	MIGUELMP	500	1	1329	T-5073	115.0%	1499	301	1699	22464 MIGUEL 230 22468 MIGUEL 500 2
22464	MIGUEL	230	22472	MIGUELMP	500	1	1329	T-5073	113.0%	-1496	-27	3694	22464 MIGUEL 230 22468 MIGUEL 500 2
22464	MIGUEL	230	22468	MIGUEL	500	2	1344	T-5074	112.4%	-1476	-22	3645	22464 MIGUEL 230 22472 MIGUELMP 500 1
22740	SANYSDRO	69	22616	OTAYLKTP	69	1	50	70035	107.3%	-55	5	448	22076 BORDER 69 22698 SALT CREEK 69 1 + MEF MR1
22604	OTAY	69	22616	OTAYLKTP	69	1	61	SL-1026	103.7%	-56	34	529	22076 BORDER 69 22698 SALT CREEK 69 1
22886	SUNCREST	230	228860	SUNCREST TP1	230	1	1183	SPS1-50285	99.5%	1156	-6	2956	Line ECO-MIGUEL 500kV & Xtrip Only
22886	SUNCREST	230	228861	SUNCREST TP2	230	2	1183	SPS1-50285	99.5%	1156	-6	2956	Line ECO-MIGUEL 500kV & Xtrip Only
228320	SYCAMORE TP1	230	22832	SYCAMORE	230	1	1183	SPS1-50285	99.4%	1151	12	2953	Line ECO-MIGUEL 500kV & Xtrip Only
228321	SYCAMORE TP2	230	22832	SYCAMORE	230	2	1183	SPS1-50285	99.4%	1151	12	2953	Line ECO-MIGUEL 500kV & Xtrip Only
22596	OLD TOWN	230	22504	MISSION	230	1	456	70025	99.2%	-443	74	1135	22771 BAY BLVD 230 22464 MIGUEL 230 1 + MEF MR1
22360	IMPRLVLY	500	22930	ECO	500	1	2598	SPS2-50286	99.1%	2590	366	2969	Line OCOTILLO-SUNCREST 500kV & Xtrip Only
22930	ECO	500	22468	MIGUEL	500	1	2598	SPS2-50286	98.9%	2564	40	2964	Line OCOTILLO-SUNCREST 500kV & Xtrip Only
22668	POWAY	69	22664	POMERADO	69	1	155	SL-5063	95.7%	-151	9	1241	22010 ARTESN 230 22832 SYCAMORE 230 1

Alternative ES-7: Consists of ES-1 + New Sycamore-Mission230 kV Line + Loop-in of One Mission-SLR 230 kV Line into Penasquitos Substation
SDG&E 2024 Reliability case
Double Contingency (Category C) Outages
Facilities loaded above 95% of Emergency Rating

Facility								Worst Outage	Loading				Worst Outage Description
From	Name	kV	To	Name	kV	ck	Rated MVA		%	MW	MVAR	AMPS	
22306	GARFIELD	69	22208	EL CAJON	69	1	102	Bus_MS69S	122.0%	-124	-21	1041	Mission 69kV S Bus
22856	TOREYPNS	69	22200	DUNHILTP	69	1	126	662/6905	115.5%	-149	-21	1218	PQ-TP + PQ-GE
22356	IMPRLVLY	230	22360	IMPRLVLY	500	2	732	IV-8022	114.6%	824	-12	2064	IV 8022 50002 & BK81 CB
22740	SANYSDRO	69	22616	OTAYLKTP	69	1	50	Bus_OY69E	114.4%	-58	9	477	Otay 69kV E Bus
22468	MIGUEL	500	22472	MIGUELMP	500	1	1329	ML-2T	114.3%	1490	296	1687	MIGUEL 230 kV 2T CB
22609	OTAYMESA	230	20149	TJI-230	230	1	796	23041B/42B	113.8%	890	162	2274	OMGP-ML #1+#2 230 kV
22668	POWAY	69	22664	POMERADO	69	1	155	23051/6920	112.6%	-177	14	1460	SX-AR 230 kV + SX-AR 69 kV
22464	MIGUEL	230	22472	MIGUELMP	500	1	1329	ML-2T	112.4%	-1488	-27	3666	MIGUEL 230 kV 2T CB
22188	DOUBLTTP	69	22164	DELMARTP	69	1	136	662/6905	108.9%	-152	-24	1239	PQ-TP + PQ-GE
22200	DUNHILTP	69	22188	DOUBLTTP	69	1	136	662/6905	108.9%	-152	-23	1239	PQ-TP + PQ-GE
22644	PENSQTOS	69	22164	DELMARTP	69	1	136	662/6905	108.8%	153	28	1238	PQ-TP + PQ-GE
22400	LASPULGS	69	22368	JAP MESA	69	1	32	007OH2/52OH	107.8%	33	-8	289	SMESA-TA+SMESA-CAP 230
22420	SILVERGT	69	22868	URBAN	69	1	100	655/699	107.7%	101	47	898	SG-CR + SG-B
22596	OLD TOWN	230	22504	MISSION	230	1	456	23028/23029	104.0%	-461	116	1189	SG-OT 230kV #1+#2
22532	MURRAY	69	22306	GARFIELD	69	1	97	Bus_MS69S	103.0%	-99	-15	836	Mission 69kV S Bus
22020	AVOCADO	69	22508	MNSRATTP	69	1	52	Bus_MN69	102.6%	-54	1	446	Monserate 69kV S Bus
22360	IMPRLVLY	500	22911	IV MP	500	1	1329	IV-8022	102.4%	-1331	274	1519	IV 8022 50002 & BK81 CB
22356	IMPRLVLY	230	22911	IV MP	500	1	1329	IV-8022	102.4%	1334	-17	3343	IV 8022 50002 & BK81 CB
22771	BAY BLVD	230	22768	BAY BLVD	69	2	285	BB-1T	101.3%	276	85	719	BAYBLVD 230 kV 1T CB
22331	MIRASNTO	69	22644	PENSQTOS	69	1	136	662/6905	99.4%	-140	-17	1131	PQ-TP + PQ-GE
22504	MISSION	230	22496	MISSION	69	2	285	Bus_MS69S	99.2%	279	47	707	Mission 69kV S Bus
22828	SYCAMORE	69	22756	SCRIPPS	69	1	154	Bus_MRGT69	98.5%	156	8	1269	Miramar1 (GT) 69kV Bus
22440	MELROSE	69	22442	MELRSETP	69	1	102	69XX/69XY	98.0%	-100	-12	836	OR-SA CKT 1&2
22771	BAY BLVD	230	22464	MIGUEL	230	1	1175	23022/23023	97.9%	-1154	-4	2889	ML-MS 230 kV #1&#2
22261	PEN	230	22716	SANLUSRY	230	1	593	23014/23015	97.4%	582	-29	1450	PEN-ES #1 + #2 230 kV

Key Points:

The results of this alternative are comparable to Alternative ES-3 as well as the Proposed Project. While the loading on Suncrest and Sycamore 230 kV circuits goes just under 100% as compared to the Proposed Project, the loading on Old Town–Mission 230 kV circuit increases to 99.2%. Also, the Poway–Pomerado 69 kV circuit is loaded to 95.7%. All this indicates that at some point beyond 2024, these circuits may hit 100% loading and require mitigation. This alternative is a candidate to compete with the Proposed Project and should be further evaluated for environmental impacts as compared to the Proposed Project.

Sample power flow plots, Figures 21, 22 and 23 follow.

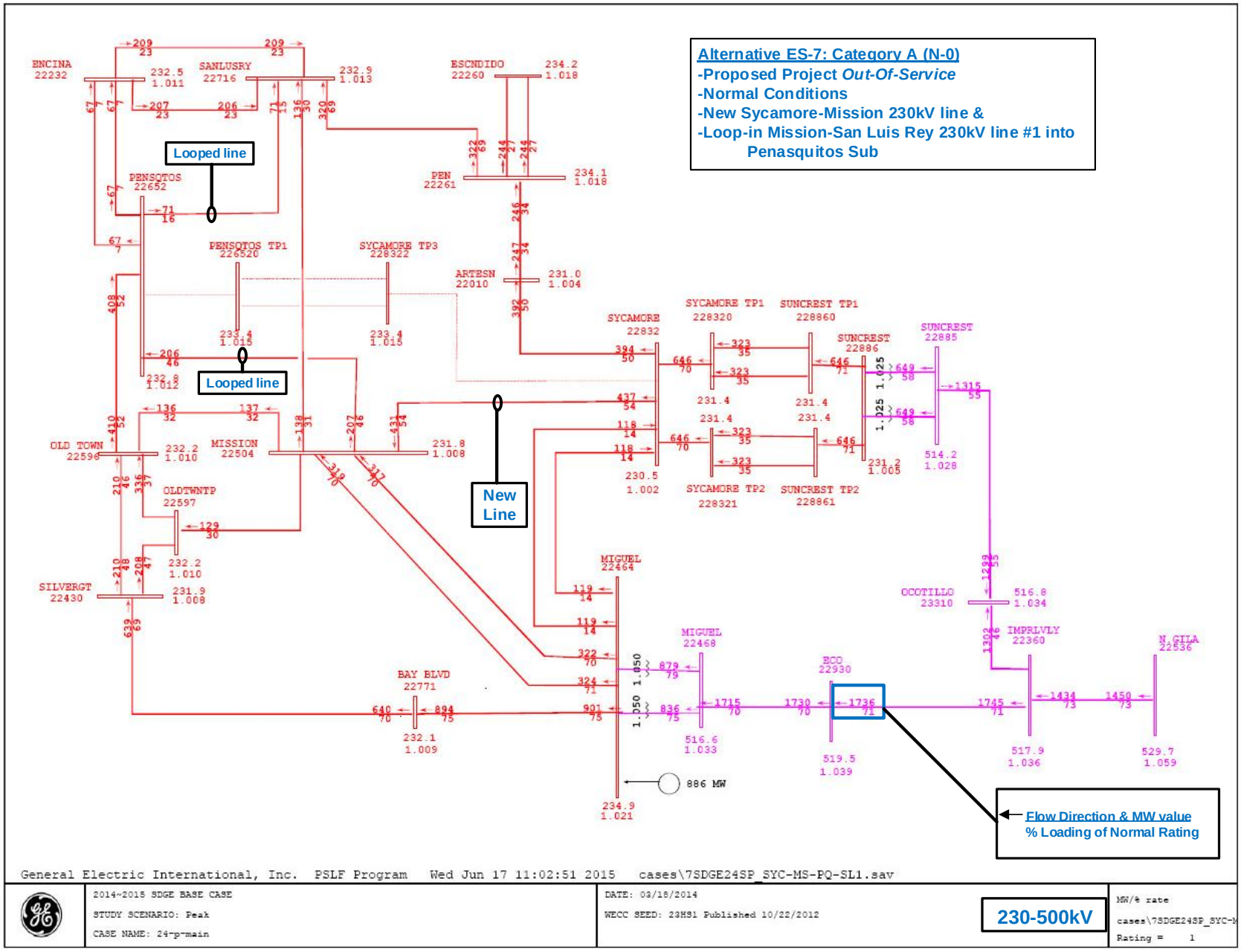


Figure 21 – ES-7, 230/500 kV Power Flow Plot, Normal conditions

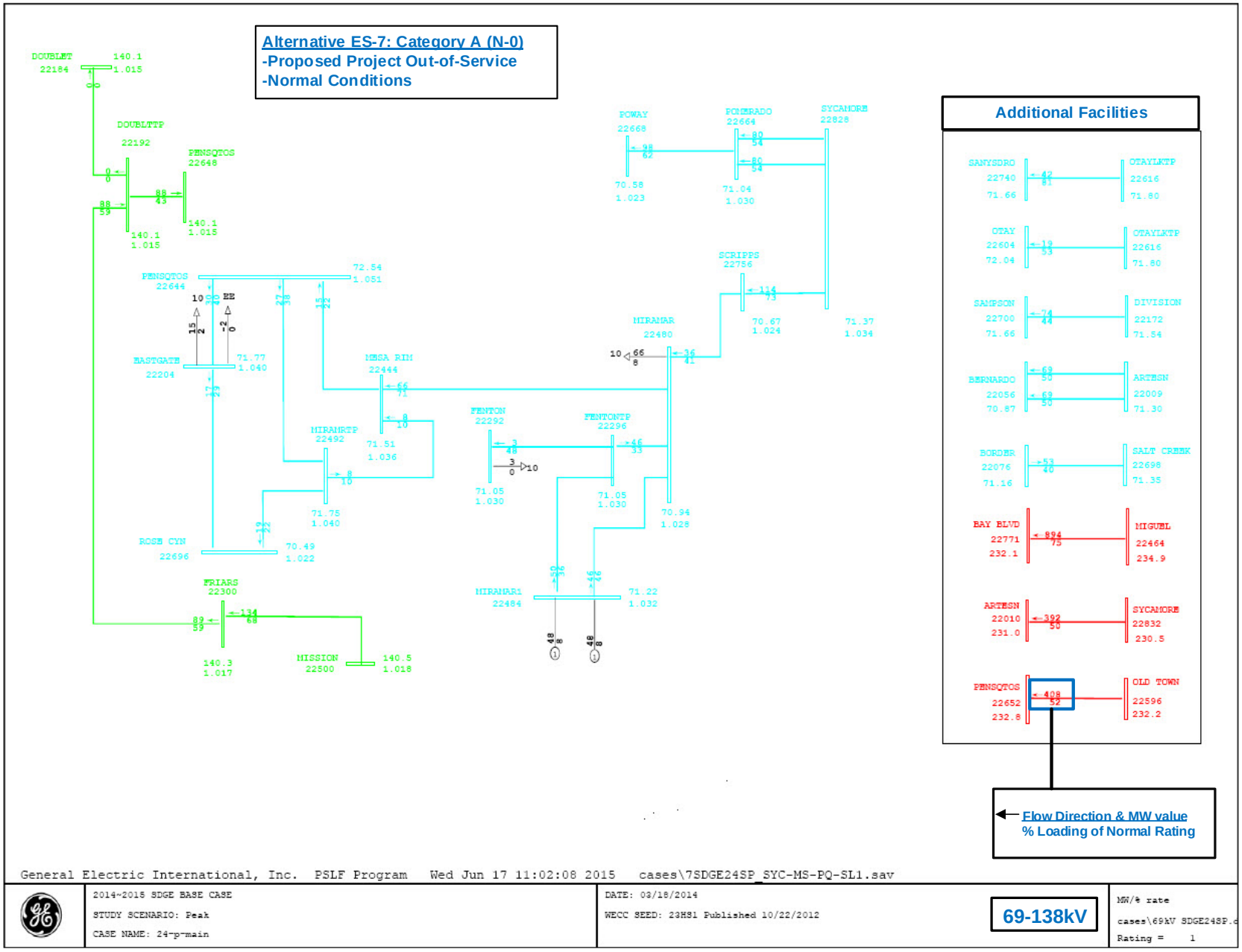


Figure 22 – ES-7, 69/138 kV Power Flow Plot, Normal conditions

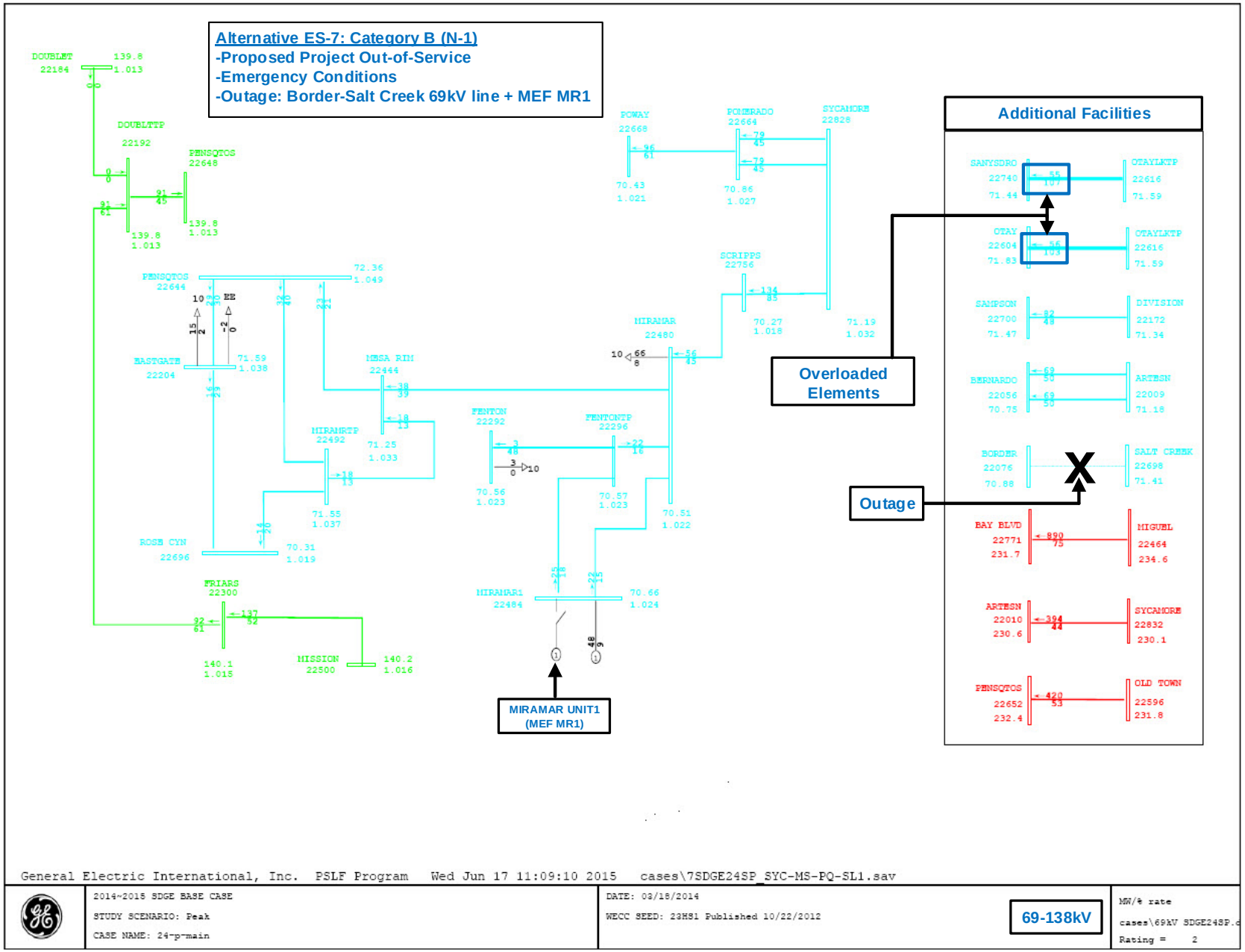


Figure 23 – ES-7, 69/138 kV Power Flow Plot, Single contingency

ATTACHMENT B

APPENDIX D
ALTERNATIVES SCREENING REPORT

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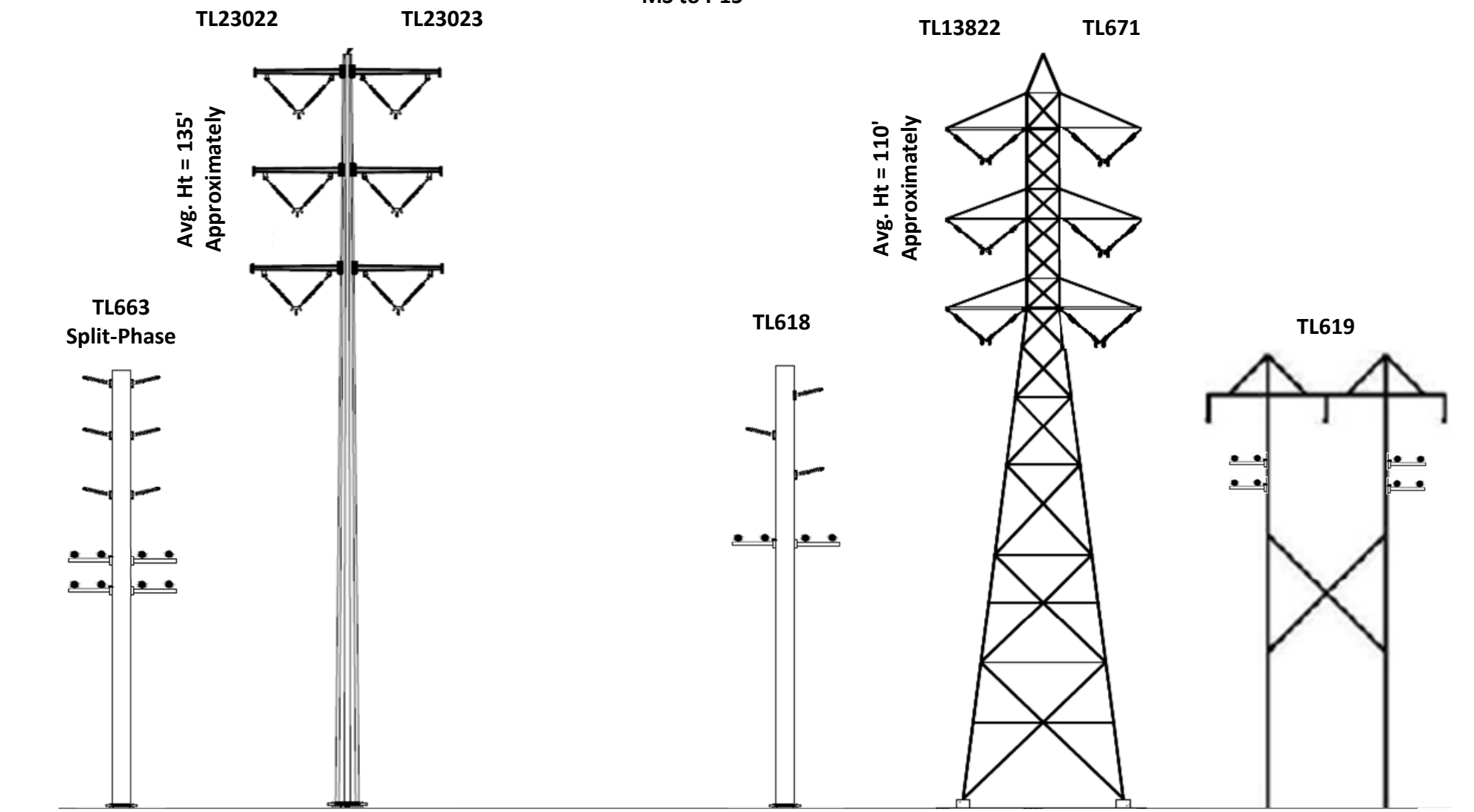
MS-SX Section 1
Existing

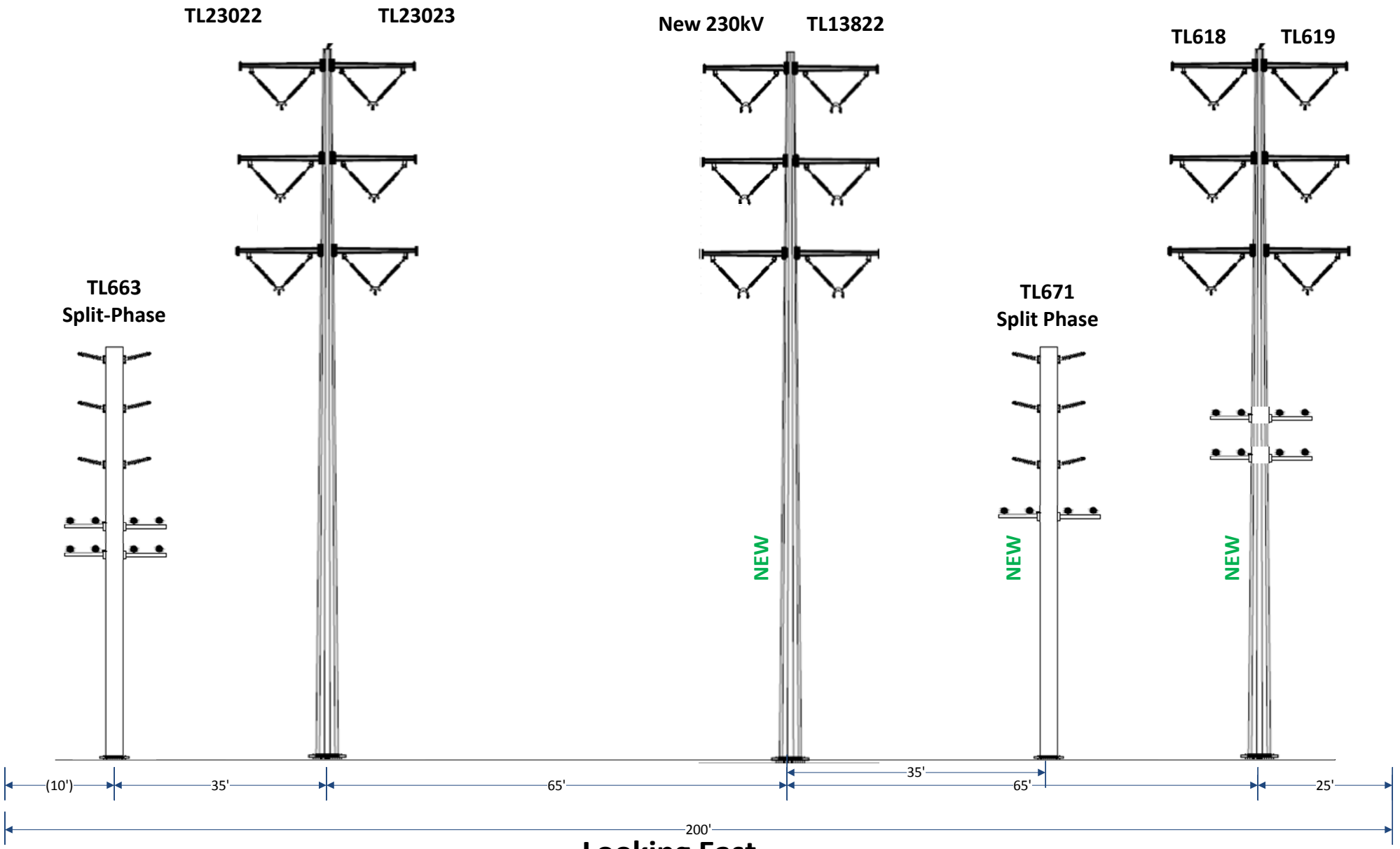
MS to I-15



Looking East

MS-SX Section 1 - Proposed

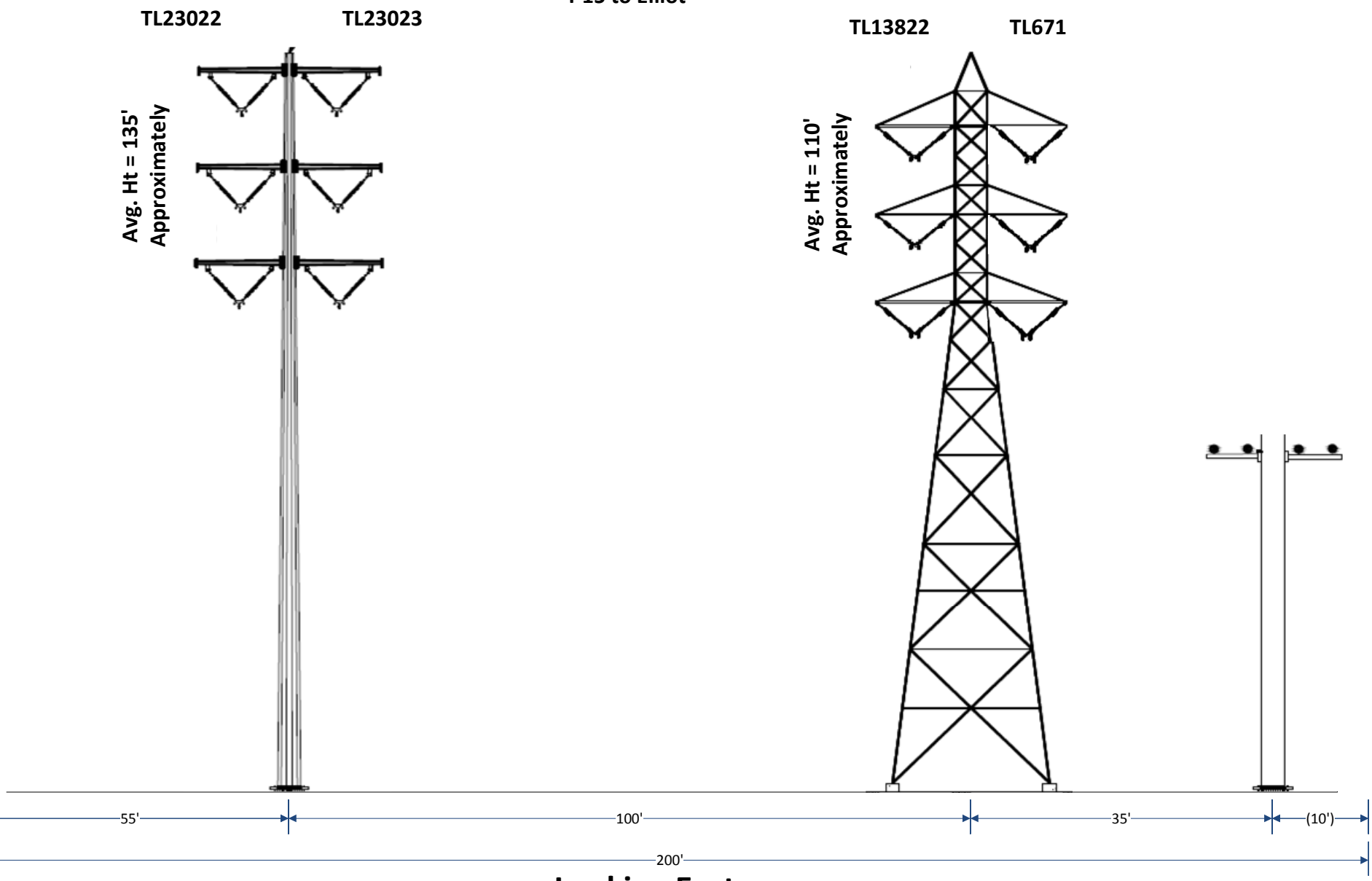
MS to I-15



Looking East

MS-SX Section 2
Existing

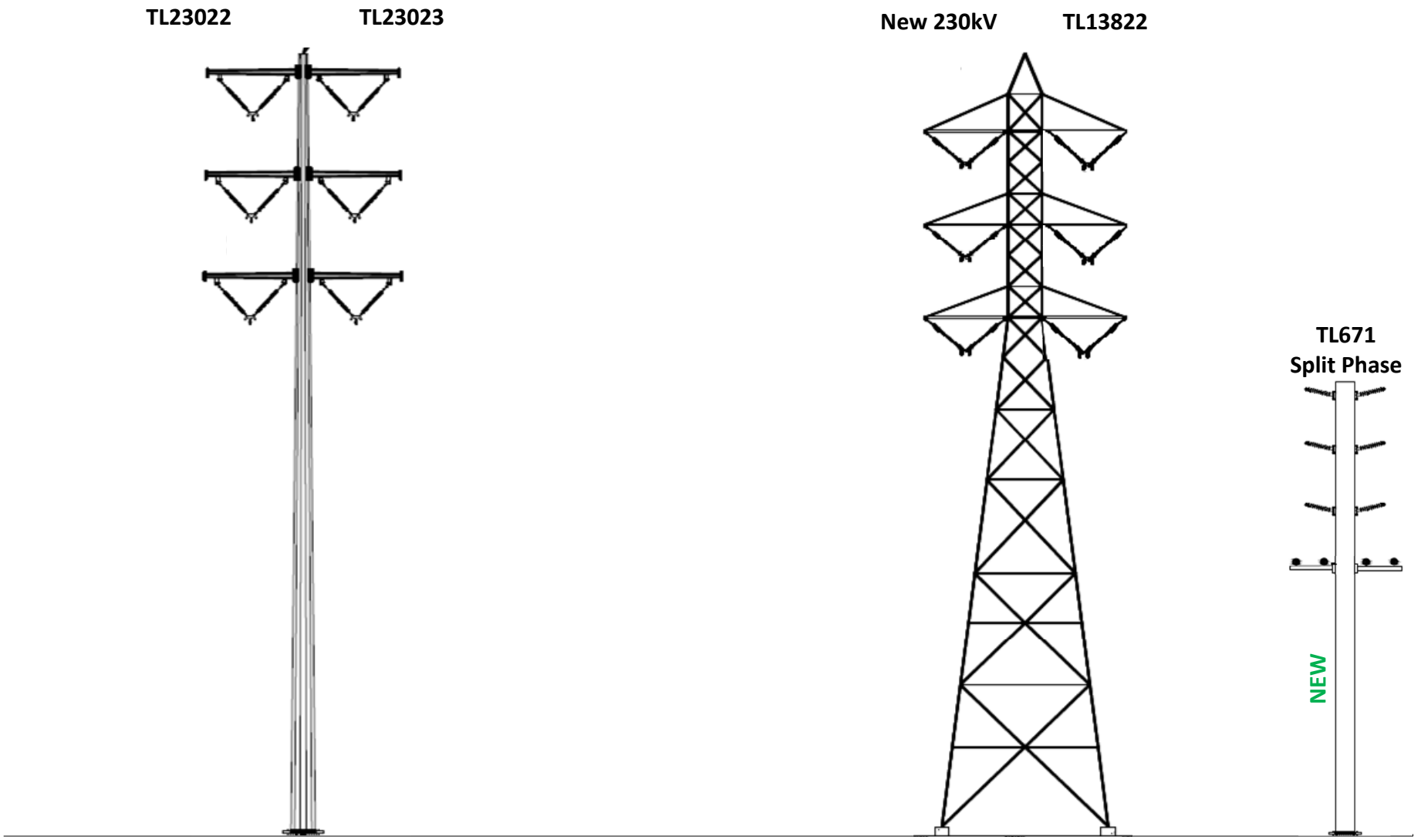
I-15 to Elliot



Looking East

MS-SX Section 2 Proposed

I-15 to Elliot

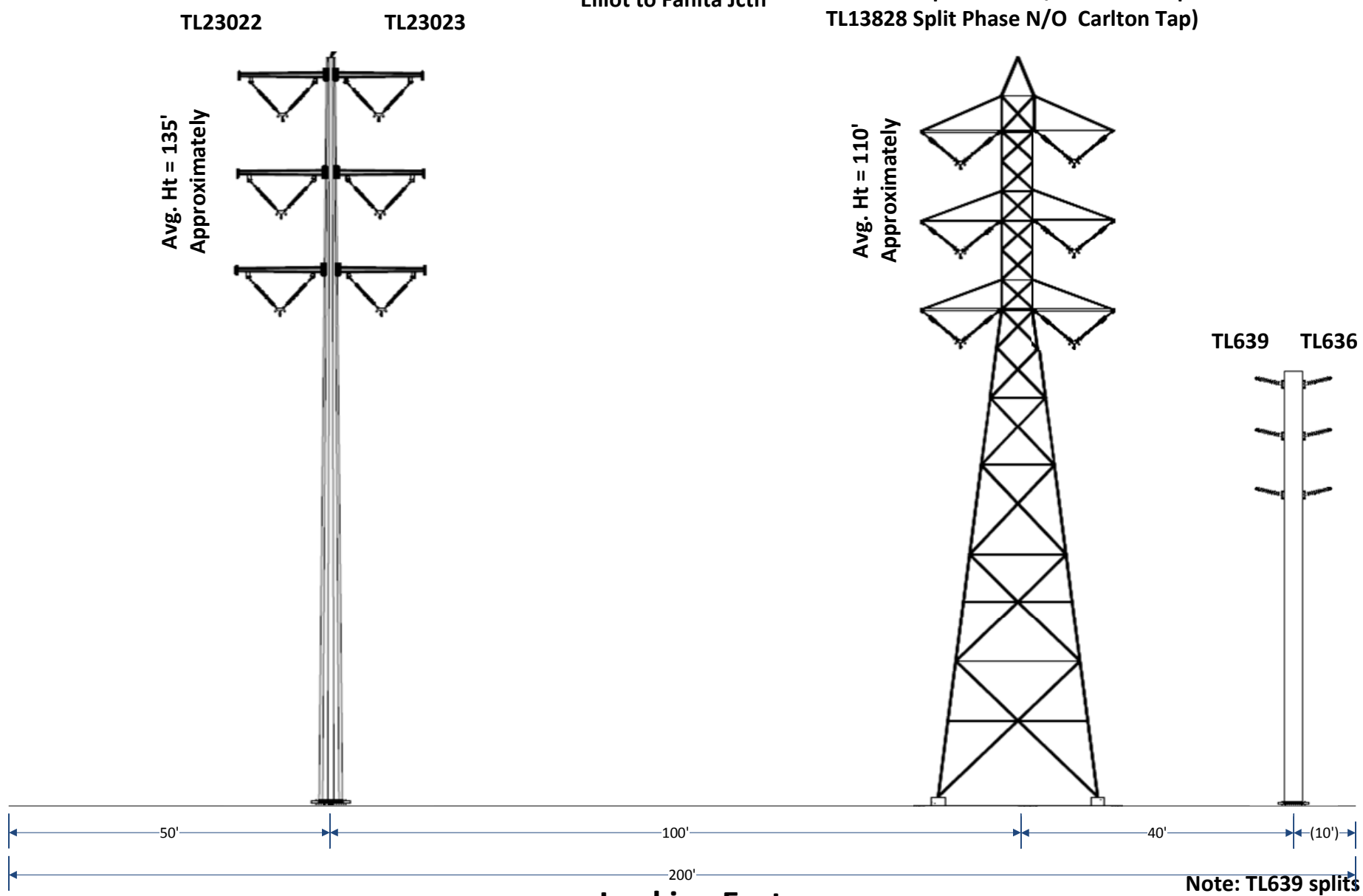


Looking East

MS-SX Section 3

Existing

Elliot to Fanita Jctn

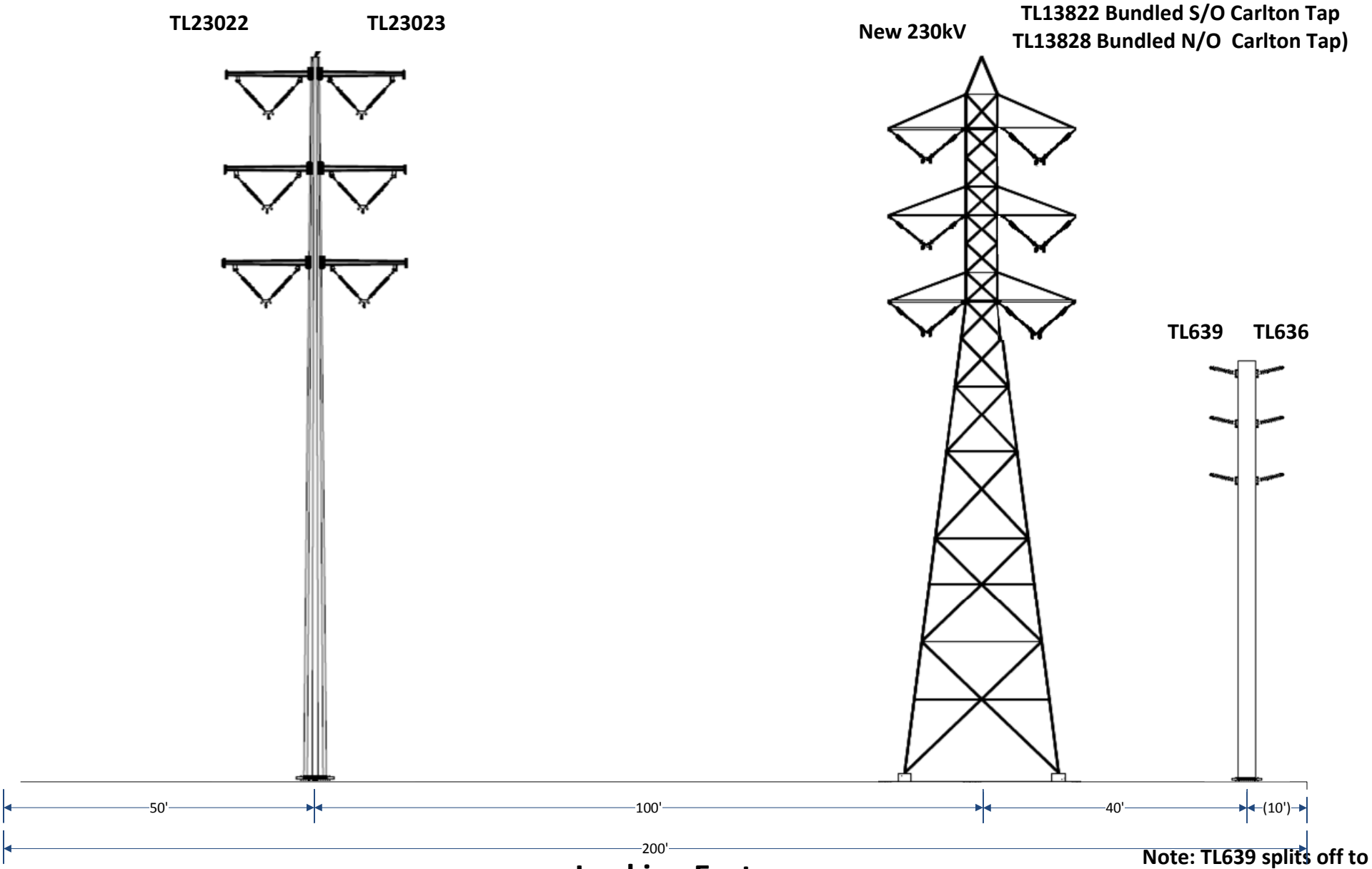


Looking East

Note: TL639 splits off to SX just west of the Carlton Tap

MS-SX Section 3 Proposed

Elliot to Fanita Jctn

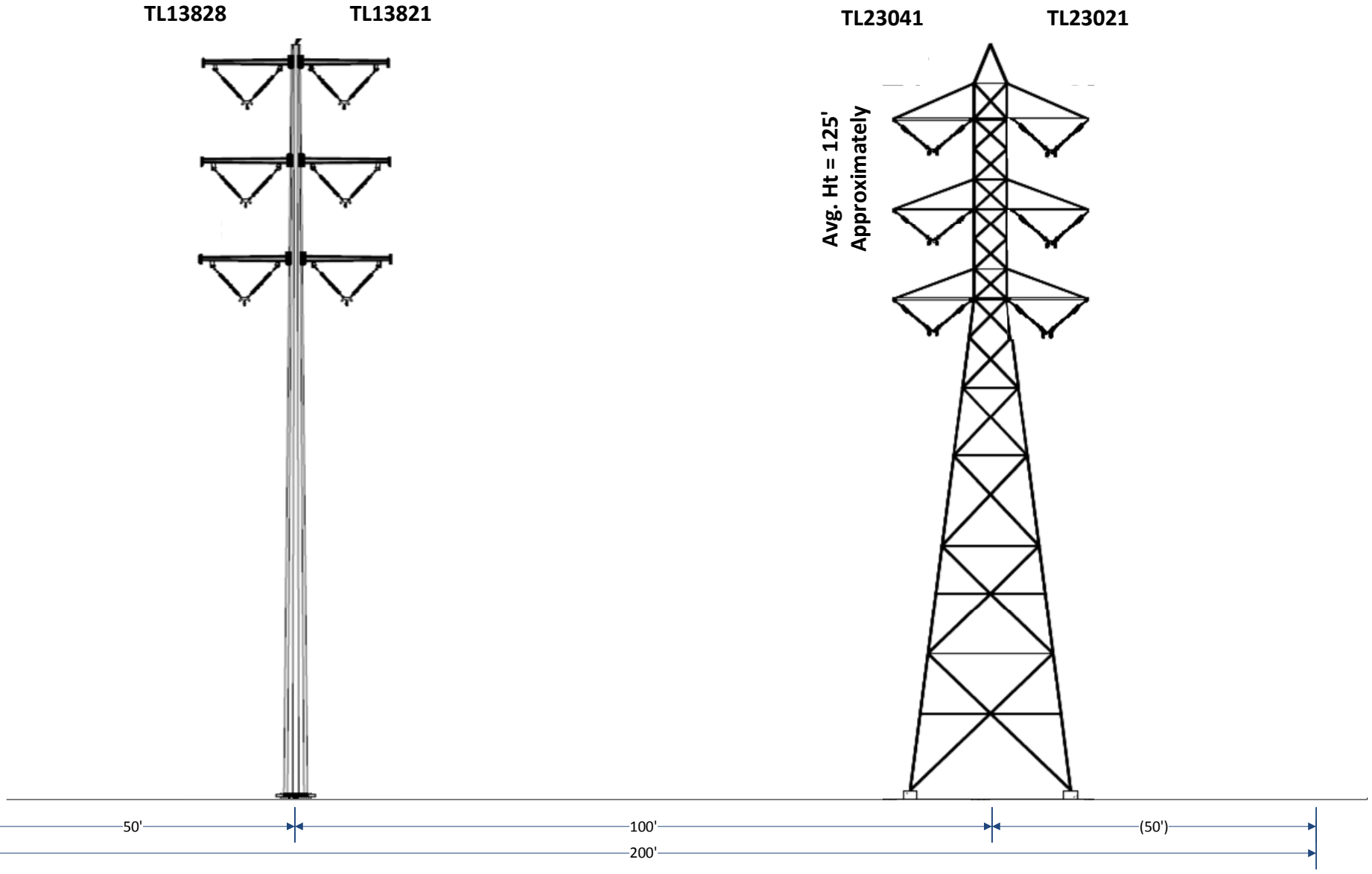


Looking East

Note: TL639 splits off to SX just west of the Carlton Tap

MS-SX Section 4
Existing

Fanita Jctn to Sycamore

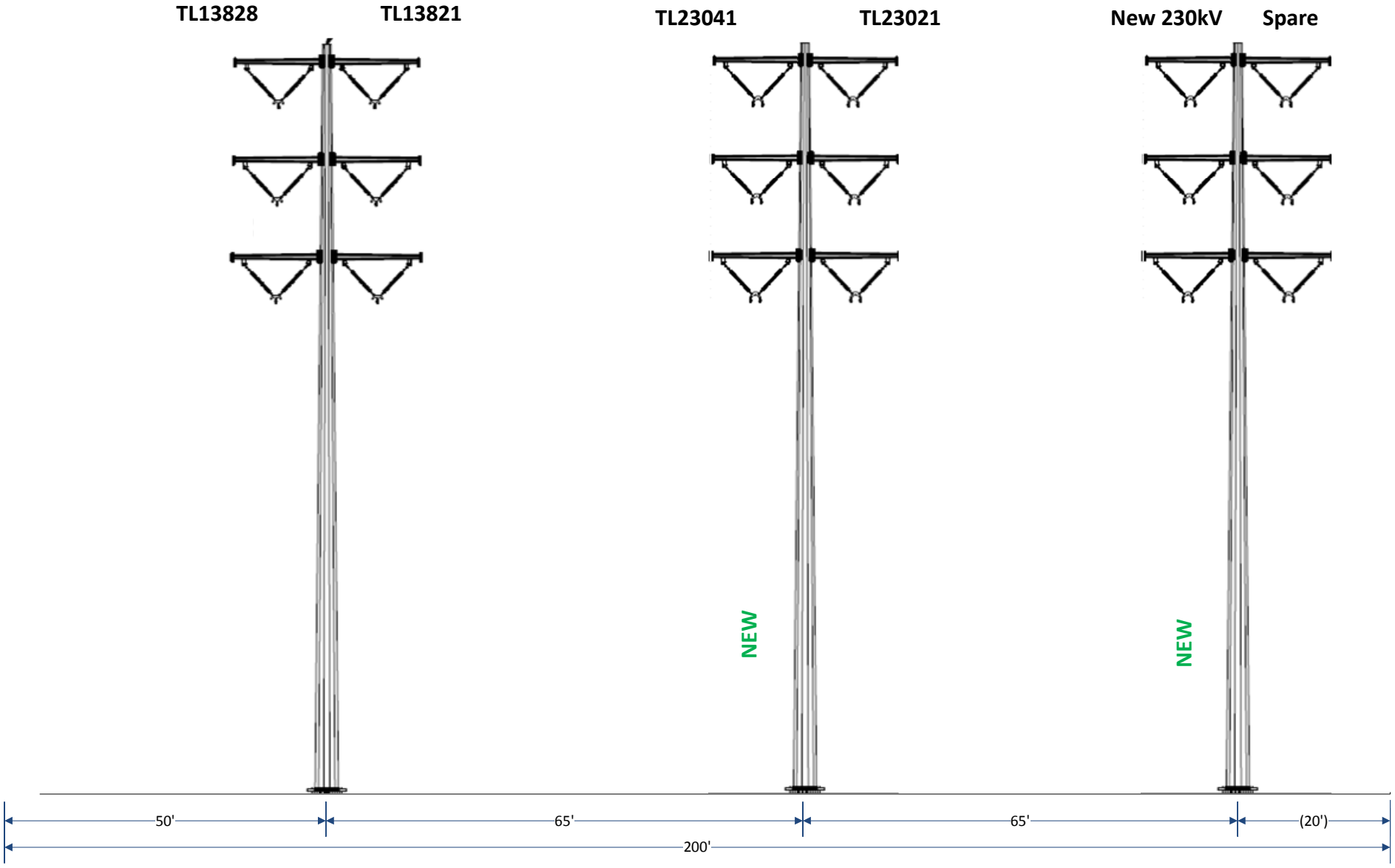


Looking North

MS-SX Section 4 Proposed

Fanita Jctn to Sycamore

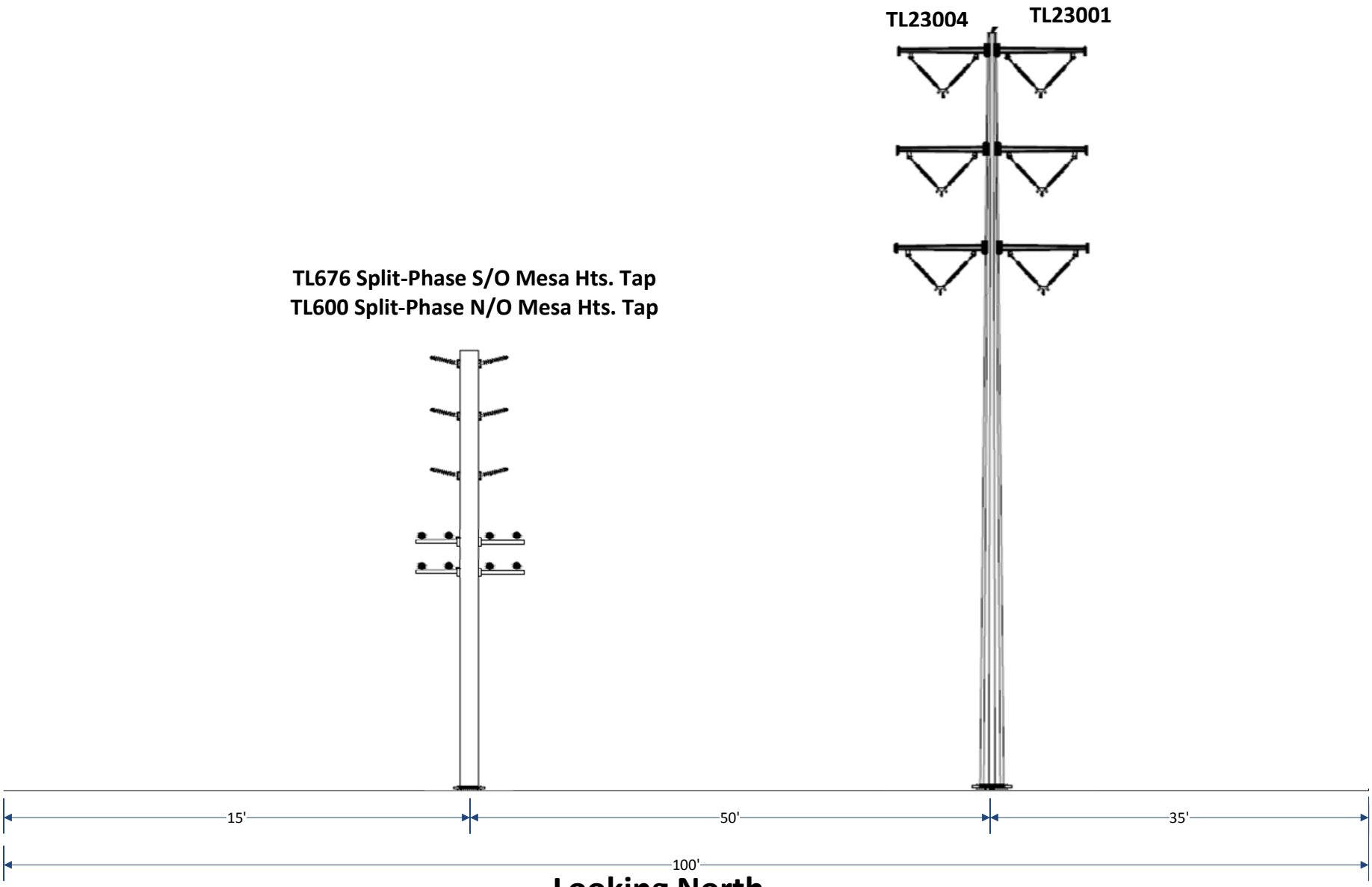
Note: Additional ROW may be required south of new 230kV poles.



Looking North

Existing MS-PQ Section 1

MS to Rose Canyon Tap

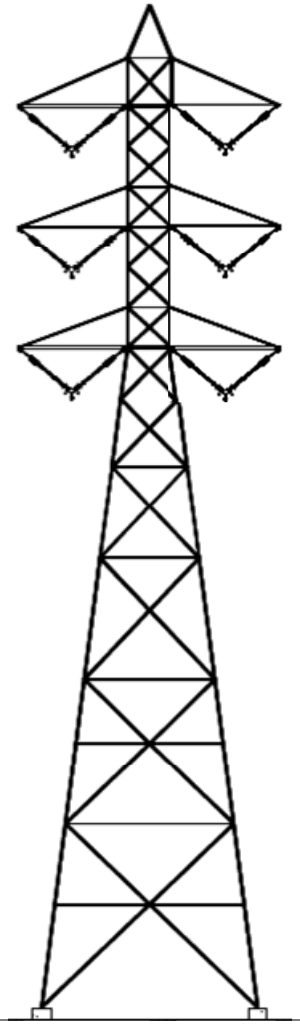


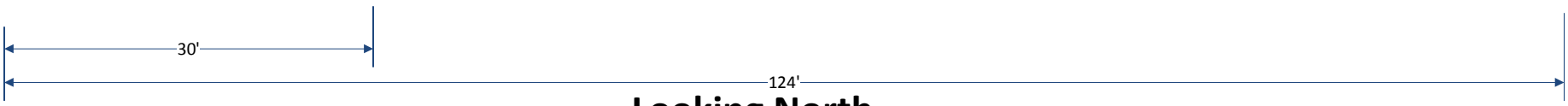
Looking North

Existing MS-PQ Section 2

Rose Canyon Tap to Copley Drive

TL23004 **TL23001**

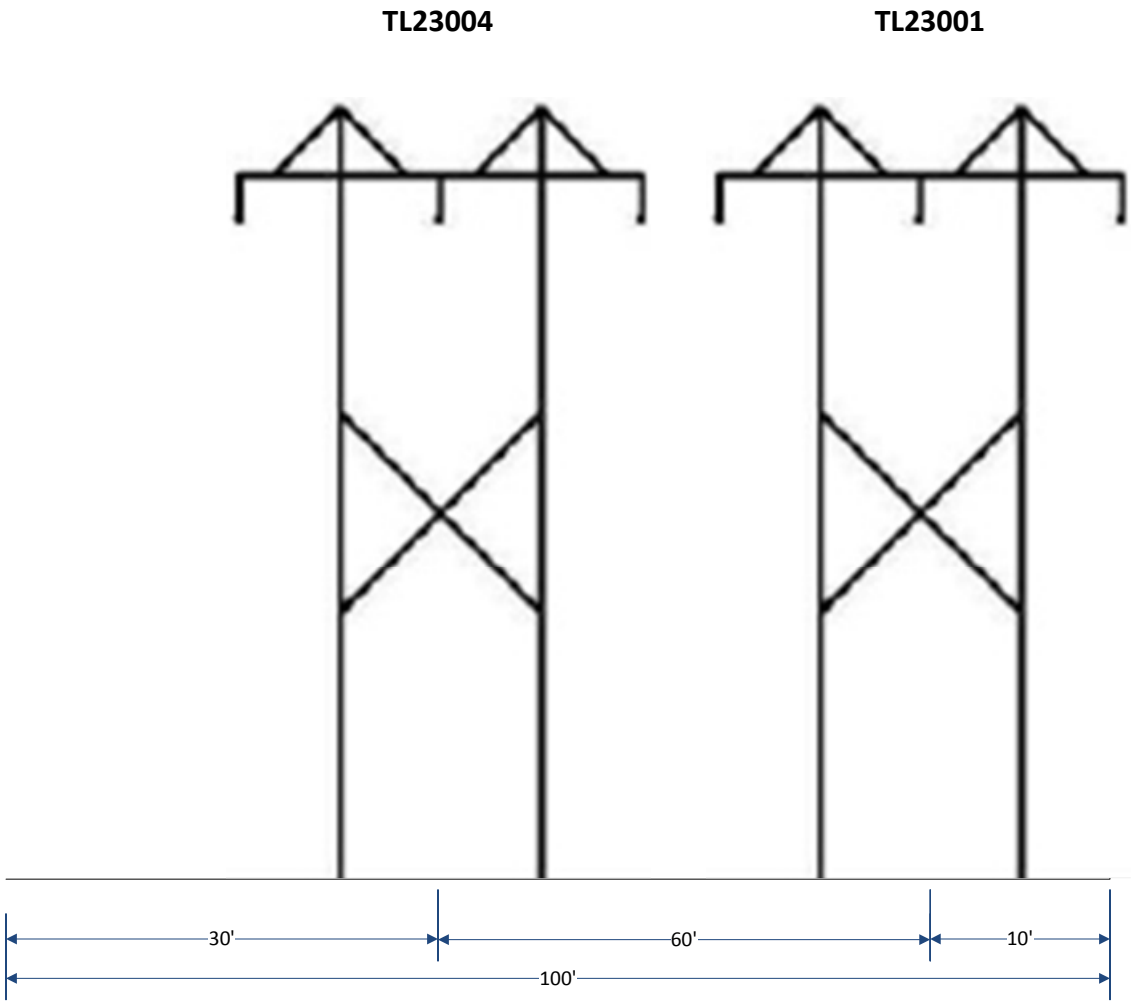




Looking North

Existing MS-PQ Section 3

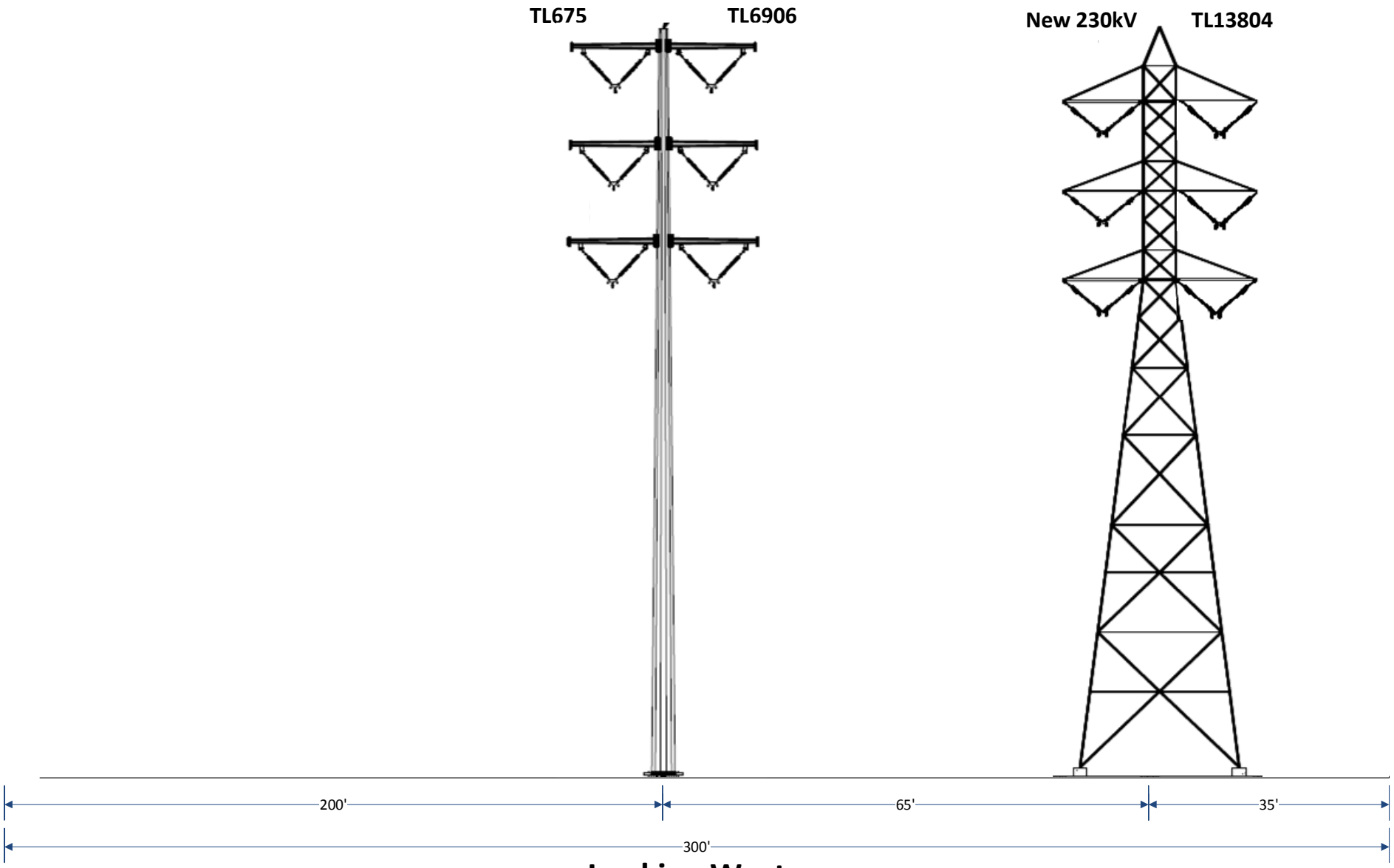
Copley Drive to Governor Drive



Looking North

PQ Junction-PQ Sub
(Proposed SX-PQ Segment D)

PQ JCTN to "PQ"



Looking West